RAILROAD GAZETTE

FRIDAY, DECEMBER 24.

Notes on the Michigan Central.

The new standard joint of the Michigan Central is 44 in. long, and is secured by six bolts, and Mr. Hawks, the Chief Engineer, assures us that he finds it far superior to the old short splice with four bolts. A careful investigation showed that after a winter's work only one splice bar in 60 miles of track was cracked. It is also found that with six bolts fewer loose nuts are found. A Verona lock-nut ⅝-in. deep was formerly used, but owing to some slight uncertainty in the manufacture of that size a ⅝-in. Verona with a ¼-in. washer is now used. The washer has a round hole, and therefore the point of the Verona cannot catch in the oval hole in the fish-plate, as was formerly occasionally the case when the Verona bedded direct on the fish-plate. The joints are also found to be quieter, a tolerably good proof that the splice and rail fit more closely together. The difficulty with creeping seems also to be diminished, as the splices bear on three ties for each rail, and the rails are thus prevented from moving and keep their proper distance apart. Where the rails are crowded together by creeping in cold weather, the expansion in hot weather is liable to cause dangerous kinks, and the experience of the Mexican Central with the long bars is claimed to show that this is considerably diminished by them. Mr. Hawks considers the length, 44 in., as very essential, and that even a slightly shorter splice will not give as good results.* A 65-lb. rail with a heavy head and light web and base is used.

A large mileage of English steel rails, 60 lbs. per yard, was originally laid on the Canada Southern in 1872. These rails have been taken up during the last summer, the battered ends sawn off, the holes redrilled and the rails again laid down for further service. A rail-sawing and drilling car built by the Bay City Industrial Works was used for this work, with most satisfactory results, 300 rails or 600 ends being sawn off in a working day of nine hours, or less than two minutes for each rail.†

A large number of new passenger stations of very ornamental design are being built or are under contemplation on the Michigan Central. The old station at Ann Arbor has been replaced at considerable expense by a very handsome and commodious structure, more appropriate to the site of the well known University. Other stations are built or building at Kalamazoo, Niles, Dexter and other points.

A new dining car is being built for the Michigan Central by the Pullman Palace Car Works at Detroit. This car is intended to combine all the latest improvements found advisable after considerable experience in the use of dining cars, which have now been used for some years on the Michigan Central. The car will have only eight, instead of ten tables as in the earlier cars. The tables will also be of unequal size, those on one side of the car seating only two persons, one each side of the table. The aisle will be some distance from the centre of the car, so that the tables on one side can be made wider, and thus afford ample accommodation for two persons on each side, or four at each table. The new car will thus only seat 24 persons, while the older cars gave a nominal seating capacity for 40. It has been found that in the necessarily limited space possible in a car, it was impossible to serve meals promptly to the larger number at one time, and therefore the nominal capacity has been reduced in order to give more room for the help to move about. This change has already been tried experimentally on a car now running, and has been found a great improvement, giving better accommodation and lessened delays in serving the meals.

Mr. Robert Miller, the Master Car-Builder of the road, has just completed a pattern 60,000 lbs. car. The car measures 35 ft. outside and weighs 27,850 lbs., about 2,000 lbs. more than the present 40,000 lbs. car. Mr. Miller has found that sills generally break just over the transoms, and has therefore used double transoms and double transom posts, so as to distribute the load. The double transom posts are capped by a corbel under the plate and thus spread the strain over a considerable distance. The iron transoms are each 5 in. wide, and are placed 10 in. apart in the clear, thus distributing the strain over the sill for a length of 20 in. The end post is secured to the plate and middle girth by joint bolts, and is also tied back to the transom posts by long bolts, which, of course, tend directly to resist the great pressure on the ends of the car when the load is thrown forward by a sudden stop. The sills are of the ordinary size, but the truss rods are slightly larger, and have deeper struts under the cross-tie timbers. The truss rods are coupled by the pressed turnbuckles made by the Cleveland Forge Co.

The trucks are made of a special pattern, and have swing motion. The arch bars are 4 in. by 1¼ in. and 4 in. by 1 in. respectively. The truck transoms are 12 in. channel iron secured to the channel bars by 1¼ in. bolts. The journals are 8 in. by 4 in., the axles being of iron and considerably heavier throughout than the M. C. B. standard.

It is intended to mark this car (the first of its kind on the Michigan Central) as capable of carrying 50,000 lbs., but when 60,000 lbs. cars become general on other lines the marking will be increased to 60,000 lbs., the real capacity of the car.

The principal car shops of the Michigan Central are situated at Detroit, and are under the charge of Mr. Bronner, General Foreman. The shops are well built of brick and are lofty, and are kept remarkably neat and clean. The odds and ends of various kinds of scrap found generally lying about in the vicinity of car repair shops are here conspicuous by their entire absence. The work on hand at the time of our visit was chiefly repairing and rebuilding old cars. Many of the old passenger cars are being modernized, the old six-wheeled trucks being replaced by new four-wheeled trucks, with Allen paper wheels 42 in. diameter. This wheel is now used under all first-class passenger equipment.

Some McEwen heaters have been lately used with very satisfactory results. This heater, which is of recent invention, and is as yet little known, consists of a double vertical cylindrical steel casing surrounding the fire. The water enters at the bottom of this casing, and ascends through tubes to a water vessel directly above the fire. These tubes being nearly straight, and not in the form of a coil, can be easily cleaned, especially as plugs are provided in the casing near the end of each tube. An upper circulating drum is placed in the clerestory, and the heating pipes are so arranged that the whole heating apparatus is inside the car, and no pipes are exposed outside the car. Loss of heat is thus prevented, and the chances of freezing materially lessened. The circulating chamber is provided with a safety valve, and it can be filled either from outside the car, or by means of a pump. The working pressure is about 6 lbs. per square inch. The circulating chamber in the clerestory is concealed from sight by an ornamental screen.

Several express refrigerator cars have been lately completed for the Michigan Central by the Michigan Car Works at Detroit. These cars are fitted to run on passenger trains, and are constructed on the Hutchins principle. The essential features are that the inner and outer sides of the car are completely isolated from one another by a packing of clean woolen rags packed tight. The body of the car is really a body within a body, no studding or framing being used to connect the two bodies, and thereby afford a means of conducting heat to certain parts of the inside casing, and thus causing local currents of air, disturbing the main circulation from the contents to the ice, and *vice versa*. The ice box is placed inside the car, and extends nearly the whole length and width of the roof, but is some inches shorter and narrower, so as to allow circulation. The ice box is filled from the roof of the car.

* The form of rail and splice used on the Michigan Central and referred to above was illustrated in detail in the *Railroad Gazette*, May 1, 1885.

† This rail-sawing car was illustrated in the *Railroad Gazette*, Nov. 19, 1886.

Contribution.

Shifting Cars at Harrisburg.

FORT LEAVENWORTH, Kan., Dec. 15, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of Dec. 10, 1886, you publish an article entitled "Shifting cars at Harrisburg." The system described therein is a repetition, with modifications, of the method in use at Port Richmond, Philadelphia, on the Philadelphia & Reading Railroad, as far back, I think, as 1873, and also at the foot of the Mahanoy Plane on the same road. At Port Richmond the parallel track was used, and the pushing stick was held on a pier in front of the switch engine. The number of the side track for which the cars was intended, was indicated by changing a large piece of sheet iron against the smoke-box, having the number of the track in white, on a black background. These squares fell forward when released, and laid flat in front of the frame of the locomotive.

The idea of having a pushing stick on a permanent pin, fixed at all four corners of a locomotive, has been in operation on the Reading Railroad for a long time, and consequently it is not a very new idea.

At the foot of the Mahanoy Plane, the switch engine occupied a central track, and the pushing stick was coupled on in the centre by a pin, thus allowing the use of the stick on either side, as required. Empty cars coming down the plane turned to the left, around and under the loaded car tracks, on a reverse curve. The switch used was the "Lorenz" switch (a split rail switch with the rubber spring, introduced by W. Lorenz, late Chief Engineer of that road), the same being always set for empty cars, and the loaded cars were pushed through the switch, making use of the safety appliances instead of a switch-tender. The traffic at Port Richmond and that at Harrisburg differ materially, and the system is worked to better advantage at a distributing point like Harrisburg.

Although this system has been in successful operation in two places on the Reading Road, yet no one has had the "get up" in them to make use of it at other important points on the same railroad.

Advantage could be taken of this method at Reading, Pa., although the grade at that point is not at all suitable for much assistance.

A great many extremely good ideas can be traced back to the old Reading Road, and such men as James Millholland never received the credit due them. E. M. SNYDER.

Angle Bars and the Bridge Joint.

COLUMBUS, O., Dec. 20, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read Mr. Clark Fisher's statement in the *Rail-joint Gazette* of December 3, which called forth Mr. W. H. Brown's reply in your issue of Dec. 10; and I have also noted Mr. Fisher's reply to Mr. Brown in the *Gazette* of Dec. 17.

Now, as to the merits and defects of the angle bar joint, I have said heretofore about all I know on the subject, and my friend Clark Fisher has likewise said of his bridge joint about all that is worth knowing; and as the case now stands it would seem that the Fisher joint may be a good thing, and still the angle bar may not be a bad thing, or *vice versa*, and it remains still to be demonstrated that because the one is good the other must necessarily be bad; and while I am not quite ready to say that they are both good, I am not quite fault-finding enough to say that they are both bad.

But this much I will say to my friend Clark Fisher, that when he quotes my other friend Mansfield as saying that the "No. 4" angle bar is breaking as badly as any former pattern, he is, in Western parlance, "*barking up the wrong tree*."

When Mr. Mansfield, in his communication of Feb. 11, 1886 (published in the *Railroad Gazette* of March 19, 1886, and reprinted in the *Railjoint Gazette* of Dec. 3, 1886), referred to the breaking of the "new heavy bars;" he never had seen the No. 4 angle bar; but he distinctly stated that the bars, of whose tests he gives the result, were of the pattern of 1884. "*None of the* 1885 *pattern with shoulder or rib were tested.*"

Now the truth is simply this, that the pattern of 1884, with which Mr. Mansfield experimented, was of the same shape and but very little larger than the pattern which we all admitted as breaking persistently and extensively. The pattern of 1885, a weak imitation of the Sayre joint, was adopted in January, 1885, *after* the supply for the year had been ordered of the old pattern of 1884, and consequently none of the 1885 pattern were ever received or put in the track at all. Pattern No. 4 was adopted in January, 1886, and from all accounts received up to this time it wears very well. It does not only NOT break, but holds up the rail ends well, and I am informed by some of the engineers in charge of maintenance of way, that in some cases, where old steel rails had been taken out of the track, with their ends depressed on account of the insufficient support of the old angle bars, those same rails, when replaced in other parts of the track, and furnished with the No. 4 angle bar, actually straightened up at their ends and have remained in good shape under a heavy traffic ever since.

When, some time ago, I asked the conundrum, "Why do rail-joints break?" I volunteered the answer that it was because they were not strong enough for the duty imposed. If I should now be asked the other conundrum, "Why do No. 4 angle bars *not* break?" I would say: Simply because they are strong enough to carry the loads imposed.

M. J. BECKER,
Chief Engineer P. C. & St. L. Ry.

The Mechanical Engineers' Convention.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The proceedings of the New York meeting were inaugurated at the Academy of Medicine on Monday evening, Nov. 29, by an address from the venerable Mr. Horatio Allen, the first man who ever ran a locomotive in America, and a member of the Society. His subject was the "Early Movement of Mechanics." His address referred to the progressive growth of the steam engine, a subject on which, perhaps, the speaker had enjoyed more varied and much longer experience than any man present. For Mr. Allen is probably to-day the oldest living engineer of prominence, although one year ago the writer could not have said this, knowing at that time Mr. Lemuel Wright, who died this spring at upward of 96 years of age.

Mr. Allen's remarks touched on the early history of the locomotive engine, and told how in England the Liverpool & Manchester road kept an offer of £500 open for a locomotive which would haul three times its own weight at a speed of 10 miles per hour, which resulted in the "Rocket." In the United States the first resolution to construct a railway on which a locomotive was to be used came from South Carolina. He had himself been commissioned to go to England and investigate the subject, and the trip resulted in the purchase and shipment of three locomotives. He then passed from locomotives to ocean travel, and stated that he was the first to declare the practicability of sending a steamer to sea with a single engine. He put this idea into practice in the case of the "South Carolina," a vessel built at the Novelty Works, where he was in charge, and sent her to Charleston. On account of a severe gale off Hatteras, she stood out to sea, and being on this account late in reaching Charleston, she was reported to have foundered, but came into port only a day late, to the triumph of Mr. Allen and the confusion of the "savants."

It appeared likewise that to this veteran author belonged the honor of being the first to advocate the use of steam expansively, and having failed to interest the Erie Railway in this discovery, he applied an expansion gear to his engine at the iron works, which worked successfully, in a manner similar to the link motion of to-day. He gave an interesting account of the surface condensers and their predicted failure and subsequent triumph, and then touched on the independent circulating pump, which he had suggested in a practical way long before it became established practice. The address of this able and venerable engineer was decidedly the feature of the convention, which in the course of nature cannot be many times repeated, and the Society, when it adjourned to the Academy of Medicine, voted the first convocation a great success.

The next day opened with the business session, and the financial report, showing that the society could pay 100 cents on the dollar, was well received. The total membership was stated to be 733, and the losses during the year by death to be 5. The library committee has a favorable showing to exhibit, and the U. S. Test Commission Committee was the first failure on the record. Evidently this failure was not due to the committee as constituted, for it comprised most eminent men, but rather to its non-political character. If the society had only possessed a few "heelers" and "rounders," men of influence, no doubt it would long ago have had its merits recognized and the desired appropriation made. The society granted the request to dis-

charge the committee, for that was really about all there was to do with them. The report which followed of the Committee on Standard Pipe and Pipe Threads was more satisfactory. They had first obtained the passage of a resolution at the joint meeting of their committee and one from the Pipe Manufacturers' Association urging the desirability of adopting a standard at the meeting of the latter on Oct. 27, 1886, and then, on that date, they obtained an adoption of the Brigg's standard of gauges. The committee were then thanked by the Convention. The Committee on Uniformity of Methods of Tests of Materials of Constructions desired more time, which was granted. The officers for the ensuing year were then announced, as follows:

President—Geo. H. Babcock.

Vice-Presidents—Jos. Morgan, Chas. T. Porter, H. S. Smith.

Managers—F. G. Coggin, John T. Hawkins, T. R. Morgan.

Treasurer—W. H. Wiley.

The meeting now proceeded to the discussion of papers and other matters of engineering interest, the first one on the list being Friction in Toothed Gearing, by Prof. Reuleaux, of Berlin. The paper bristled with differentials and subscript accents, but the diagrams looked well and the integral signs gave the paper a familiar look, being very similar to the old-fashioned S used in the early versions of King James' Bible. The paper was able, however, and was well discussed.

Prof. Thurston followed with a paper on Friction of Non-condensing Engines. He had investigated this matter last winter with a straight line engine fitted with a brake. He found the friction constant at a given speed with all loads, but variable with a variation of speed, increasing with increased speed. It also increases with an increase of steam pressure. Thus the total resistance, measured at the piston of the engine, consists of two factors: one constant at the working speed to all intents, and the other varying with the external load. Mr. George Barrus sent a written discussion of this paper, and cited his experience of a confirmatory nature with the Corliss Engine, and also with a Westinghouse. The paper was further discussed by Prof. Lanza and Mr. Wolff. Mr. Kent thought the friction of the piston rings was a great factor of the friction.

The paper of A. Wells Robinson on Recent Improvements in Dredging Machinery followed. The author first considered the chain bucket elevator because there were few instances of them in the United States, while in England and on the Continent they are the usual type. He thought the strong point in the endless chain was its continuous action, and where the work is of great extent it can deal with large quantities at a rapid rate. He thought, further, that the digging action took place in a manner calculated to apply the power to the best advantage, since the cutting edges enter horizontally and curve upward in a short radius, thus filling the buckets and retaining their contents, and enabling the machine to take off light cuts over large areas as efficiently as heavy cuts. Another good point was the fact that the entire apparatus is in equilibrium as to the weight of the working parts, power being required to elevate the dredged material only and to overcome the digging and frictional resistances, while in the dipper or grapple dredge he thought the power lost in lifting the bucket to be considerable, especially in deep water. He then showed diagrams of various forms of dredges, and the discussion which followed seemed to rather favor his view, Mr. Hill relating his confirmatory experiences in Idaho in working alluvial deposits with a chain-bucket dredge. Mr. Towne thought the rapid motion of a chain-bucket dredge made it more liable to get out of order, and thought that, to be effective, it must be of large size.

The topical questions cropped out in the afternoon session, and the first conundrum was, "How Should a Laboratory of Mechanical Engineers be Equipped?" Prof. Lanza showed how the students should be trained, and urged the cultivation of habits of accuracy necessary to expert work. He thought testing apparatus, steam engines, boilers, indicators, gauges and dynamometers should constitute its equipment, and it may be said that a view of Prof. Lanza's own thoroughly equipped workshop bears a practical answer to his views on this subject. Mr. Towne said the great thing to teach young men was how to think and how to help themselves.

The next topic was of a similar character: "What are the best problems for Students in Mechanical Engineering in the Last Year of their Course?" One speaker favored teaching them preparation of parts and designing; another, while favoring this for the preceding year, thought the last year should be devoted to the theory of thermo-dynamics and other matters of difficulty.

The next topic was: "Can you give any data from your own experience as to the power required to drive American machine tools?"

Mr. Babcock gave a rule of thumb, viz.: One horse-power of engine for every 10 men at work in a shop. Mr. Wilfred Lewis gave some figures on this subject based on the square inch of section removed by cutting tools, in terms of resistance in pounds per square inch.

Another speaker thought a larger amount of power was absorbed in transmitting rather than by the tools. Mr. Towne thought the number of blowers used in his factory absorbed more than half their power. It is well known that a "blower" will waste an immense deal of energy, so this statement did not surprise any one present.

The reading of regular papers then followed, beginning with one, by Prof. Lanza, on the "Strength of Shafting subjected to both Twisting and Bending." He made the actual test in practice by putting up the shafting and twisting and bending it. His results showed "in line shafting, as in most cases of head shafting, the breaking is even more liable to occur from bending back and forth than from twisting," and hence no one should neglect to make a computation for bending, as well as twisting. This view was supported by the discussion, in which Messrs. Kent, Herring and others took part. The paper of Prof. Alden on "Formulæ and Tables for calculating the effect of the Reciprocating Parts of High Speed Engines" was a useful contribution, and contained valuable tables. It was discussed by Messrs. Lewis and Lanza.

Mr. Geo. H. Barrus contributed an interesting paper on "A New Calorimeter," which described the apparatus and its application for determining the moisture in steam. It was accompanied by several tables of results.

The topical discussion being resumed, the following query was made: "What are the best conditions for Flying Rope for Transmission of Power, and are there Limitations to its Use?"

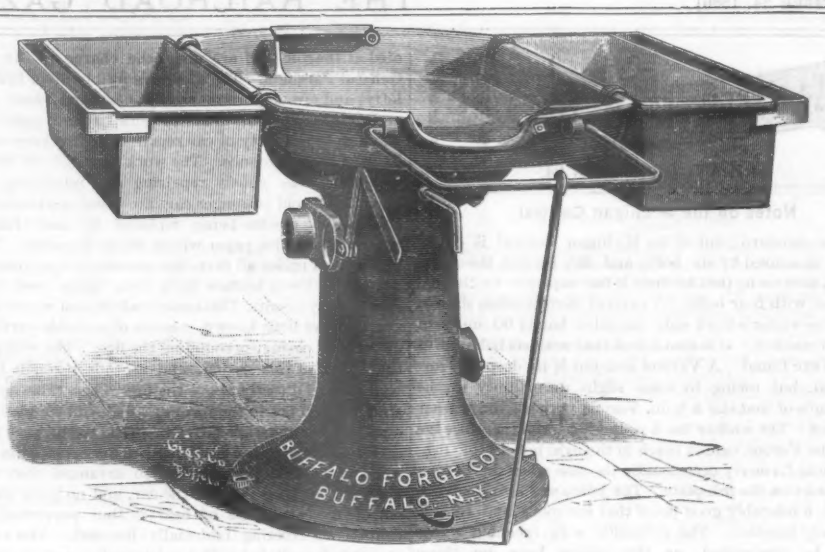
Mr. Sterling had enjoyed a subject of rope flying, it was evident from his remarks. Plainly, his rope wouldn't fly. He might have seen a horse fly, but not a rope, but all had seen a rope walk.

Mr. Giddings gave Prof. Sweet's experience in transmitting power 1,100 ft. by ⅝-in. wire rope. After two or three years they found it necessary to have the rim of the wheel and the grooves perfectly true, or there was great vibration. Evidently this method was no favorite, although Prof. Hutton cited Prof. Reuleaux as being an extreme advocate of this method.

In the evening a party visited the American Institute Fair to look at the machinery, and the next day was devoted to an excursion by boat to Newark, N. J., stopping at the Bartholdi Statue.

It is believed that this was the first party to make the ascent, and it was a good climb, as the lungs of the party found. We were well repaid, however, by the sight which greeted us, as we gazed through the openings in the crown in Liberty's brow. The U. S. Electric Light Works occupied the interest of the visitors to such an extent that it was almost impossible to get them away, but time demanded it, and Watts, Campbell & Co.'s engine works was the next stop, where all were delighted with the perfection attained in the line of the work. The great mills of the Clark Spool Thread Works next absorbed the party, and to such an extent that it seemed almost impossible to find them, and still more difficult to get them away from there. The party are not noted for their susceptibility, but the writer noted some six prominent engineers listening most attentively to a pretty operator while she explained the action of a remarkably simple machine, which even a junior member could have understood at a glance. They seemed determined to know the minutest detail. After visiting various other works the party were taken to Mr. Weston's private laboratory, which is probably the most complete in the World. Every mechanical and electrical appliance of value in investigation is to be found here, and there is a fine chemical laboratory in the front room. The Armington & Sons' engine furnishes the motive power and was running 300 turns as noiselessly as the snowfall. Mr. Weston received his guests with his usual unbounded hospitality and their great regret was the shortness of their stay.

The next day, the reading of papers and the topical discussions were resumed, but the subjects, with the exception of Mr. Baker's paper, were so purely mechanical that they hardly have place in a railroad journal. Mr. Baker's paper gives an account of certain experiments he had made in testing iron and steel in his connection with the Forth Bridge. After showing how indefinite a term the "factor of safety" was, Mr. Baker proceeded to show the behavior of various pieces of iron and steel under tests. He claimed that no one could accurately determine the strength of a structure by breaking a piece of the material in a testing machine. He preferred the gradual accumulation of the results of actual working, or tests made of the material under conditions similar to those occurring in practice. He then gave the results in various tables, and in one instance cited the behavior of "mild steel," which he believed to be more uniform in its action than wrought iron. The claims of Mr. Baker's experiments have the prestige of his name as he is well known to be one of the most careful and accurate investigators of his day, and the paper in full would no doubt find a large class of readers.



NEW BLAST FORGE.

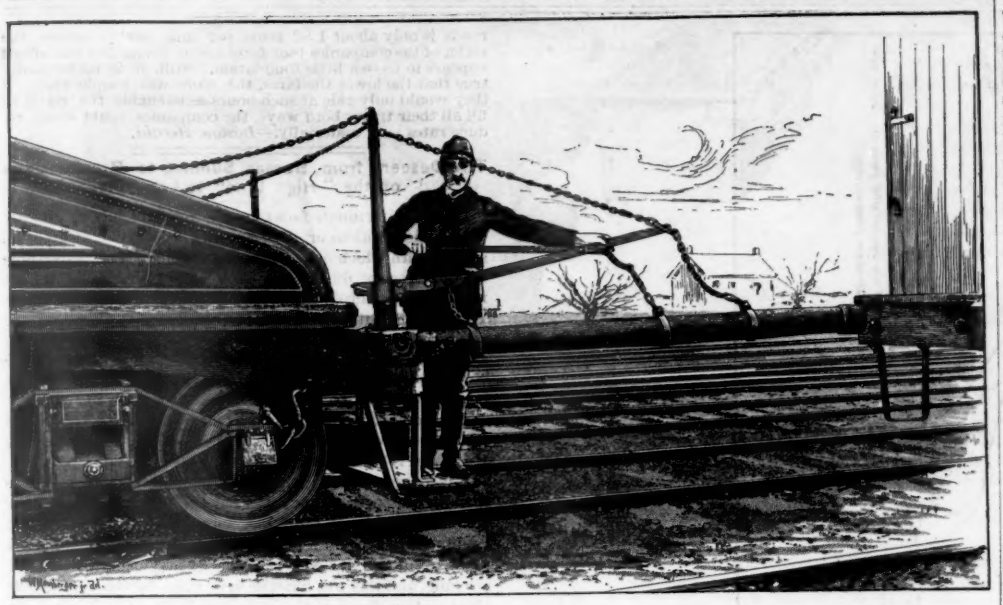
As the session was held at the Stevens Institute by invitation its hospitable head, Dr. Henry Morton, very kindly invited the Society to a most delightful lunch at his house. At night there was a meeting of the new council held, and all prepared to enjoy the hospitality of the Pennsylvania Railroad on the following morning. This road is certainly one of the most liberal and intelligent in the world, as to its management. Whenever there is a scientific body to be entertained, there will be found the Pennsylvania Railroad ready to show them some courtesy. The visit to Trenton, accomplished in a remarkably short time, proved to be all that was anticipated. The railroad officials, when asked at what time it would be convenient to run the special, replied: "At any hour which would suit the visitors," and it was the same on the return. The station agent at Trenton had his instructions, the engine was on the side track, and as soon as the cars were hauled down from Cooper, Hewitt & Co.'s switch, there was not a delay of two minutes. It is believed there is not another road in the world where the advent of a special would be attended with so little "fuss." There was absolutely none, and the writer desires to bear witness to the perfectness of this system and its complete adaptability to its ends. After reaching Trenton the Society were taken to Cooper, Hewitt & Co.'s copper mill, and saw 20 inch beams rolled, and thence into their bridge shops where their riveting machine attracted much attention. Lunch was served at Cooper, Hewitt & Co.'s upper mills, and the wire mills were then visited. Many of the ladies visited the potteries to learn on which side of a jug the handle is, while some of the sterner sex went off to find out an answer to this topical query, "If the handle of a jug is put on the outside, what is put on the inside?" And this solution was perhaps quite timely as the weather was extremely cold, and a calorific equivalent quite a necessity. The Phœnix Iron Works were then visited, and their new straight line engine admired; also the works of Fisher & Norris, where the editorial room of the *Rail-joint Gazette* was found, and the genial head, Mr. Clark Fisher, showed us how they made anvils, rail-joints and other good things which men need. The early history of these works was extremely interesting, and their growth has been rapid and substantial. The party were safely returned by the Pennsylvania, as they always expect to be, and thus ended the Seventh Convention.

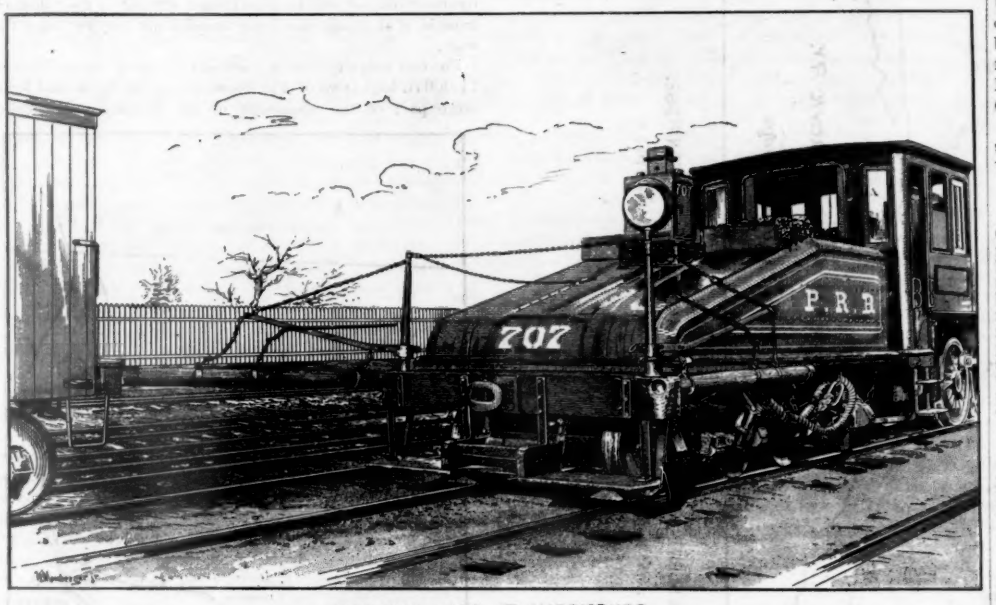
Errors in "Bradshaw."

TO THE EDITOR OF THE RAILROAD GAZETTE:

I observe that you very rightly expose some of the absurd errors that occur in the recently started American edition of Bradshaw's well known Railway and Steamship Guides. Will you, however, permit me to say that I have used Bradshaw's railway time-tables for Great Britain pretty constantly during the last 25 years, and have only found one slight mistake in that time. As Bradshaw gives the time of *every* train carrying passengers, this is no small feat. I have edited a local time-table myself, and know how difficult it is to obtain accuracy.

The mistakes in the American edition of Bradshaw are of little moment to Americans, who would, of course, use one of the numerous American guides, but it is very annoying to Americans who travel in Europe to find on arrival on the other side that guides and time-tables published here contain errors even more glaring than those you point out in Bradshaw. I will give only one case. There are three, or at the most four, recognized railway routes between Liverpool and London. They run in all about 30 trains a day in each direction, the distance varying from 192½ to 235 miles and the time ranging from a little under five hours to a little over seven hours. Yet a guide I once saw advised American passengers landing in Liverpool to take a steamer to Glasgow and thence go by rail to London. The steamer takes fully seventeen hours, and the quickest train ten. The total length of journey would be about 630 miles and the time at least 28 hours. This is the most flagrant mistake I can remember, but others of less moment will be found in many of the publications which pose as the guide, philosopher and friend of the American abroad. The moral is, get a native guide who speaks the language, and personally, I always buy a book of time-tables and maps published in the country in which I am traveling.





SHIFTING CARS AT HARRISBURG.

In England, either Bradshaw, or one of the big penny time-tables issued by each railroad. These give every possible information, and even tell the traveler at what rate he can be carried when no longer living. An official time-table for all railways is published in France and in Germany, Holland, Belgium, and Switzerland. I have always found the local time-tables clear and accurate.

I would like to ask through your columns if there is any inherent cussedness in the American atmosphere which makes it imperative that:

1st. The times of passenger trains should be changed without warning and at irregular dates.

2d. No time-table of local, suburban or rapid transit trains shall ever be procurable or visible under any circumstances whatever.

3d. No railroad will ever display its own time-tables at any of its stations.

4th. At all stations where any time-tables are displayed, no road less than a thousand miles away shall have a show.

May I ask why these laws of the Medes and Persians are better obeyed than any others in Uncle Sam's statute-book?

UBIQUE, PER MARE, PER TERRAM.

Shifting Cars at Harrisburg.

The accompanying illustrations should have been given in connection with the article on "Shifting Cars at Harrisburg" which appeared in our columns Dec. 10, but the photographs from which our cuts were prepared came to hand just after we had concluded that the article could be held no longer in expectation of receiving them.

It is hardly necessary that we should do more than refer to the full description we then gave of this admirable system, in reproducing the engravings which show just how it is done and how the poles on the switching engines are rigged. We may, however, reproduce a few sentences sufficient to explain the engravings and lead to a reference to the article.

"In these days of numerous and omnipresent 'switchers' there are many yard men of the younger generation who would scarcely believe that horses could be of service in a freight yard; but in the primitive times they were employed, as they are still, and very extensively, in England and on the continent, and they had some peculiar advantages. One of these was the fact that they could be hitched to the side of a train, and could thus 'kick off' cars from the rear without going to the front end and pushing the whole train every time a single car was to be thrown back; and could 'fly' cars from the front end into a side track without making any flying switch at all (as an engine would have to do); in short, they could be changed from the front end to the rear and from one track to a parallel one alongside; could go first to one end and then to another without using a single switch or wasting a single step. By a very simple arrangement the Pennsylvania Railroad, in its large distributing yard at Harrisburg, secures most or all of these advantages without the disadvantages. What horses used to do with eight-ton cars, containing ten tons or less of freight, is here done with twelve-ton cars piled up with 25 or more tons of coal or other merchandise apiece, by the aid of locomotive power.

"This is accomplished by having the switch engine work on a parallel track to the cars to be switched, and not on the same track. On each rear corner of the tender and on each front corner of the locomotive is a pole or push-bar, suspended from a short standard, so as to be readily controllable by one man, or to be readily stowed away on rests when out of use, in a manner difficult to explain without an engraving, which we are now able to give.

"Trains of 60 and 70 cars arriving from the West, requiring to be separated into from 20 to 60 different parts for distribution to the proper tracks, are stopped at the entrance to the yard, and the engine detached. The switching engine stands on a contiguous parallel track near the front of the train, and is accompanied by a crew of eight or ten men (sometimes more) whose conductor has already in his hand a list showing the destination of every car in the train. This list comes from the train conductor by telegraph an hour or more before the arrival of the train, and is copied in manifold so that the switch-tenders can have copies. This supplying switch-tenders with written instructions is no more than many conductors do, and have done for years; but in a yard handling 2,000 to 4,000 cars per day it becomes quite necessary to have the list telegraphed ahead so as to admit of modifications in the distribution. For instance, if there should be a rush of New York freight, the New York track might be overcrowded and necessitate the use of some other track; and the instructions concerning such changes can, by the aid of the telegraph, be given to the switchmen in ample season, and confusion avoided. The east-bound yard at Harrisburg has some 25 or 30 tracks, and at present three switch-tenders are required in distributing a train into the 15 or 20 tracks which almost any one train is likely to require for its proper sorting, so that four copies of the list are manifolded by the operator. Extensive improvements already begun, which include a new passenger station and train shed, and separate tracks through the city for passenger trains, will eventually still further simplify the work. Superintendent McClellan contemplates, we believe, the introduction of a tower, and changes in the tracks which will dispense with two of the three switch-tenders. With tracks arranged as in the West Shore freight yard at Buffalo, or like the Union yard at Denver, and levers concentrated in a properly located tower, without any, or without much, interlocking, one man could doubtless handle the switches for distributing to a very large number of tracks."

The article then continued to give further and full details as to just how the work is done, and what advantages are secured thereby.

As will be seen from the communication in another column the plan appears to have been used elsewhere at an earlier date than on the Pennsylvania, as is but natural. It is all but invariably the case that any "kink" of the kind which has real merit in it will prove to have been originated and applied more or less completely at several different points, independently of each other, and perhaps somewhere have been in use from a very early date. Where or how the plan originated, however, is a minor question. The more important one is: Has the plan merit entitling it to wider use?—a question which, we think, must be unhesitatingly answered in the affirmative.

Blast Forge.

The recently introduced blast forge, shown in the accompanying illustration, is made by the Buffalo Forge Company, Buffalo, N. Y., and is especially designed for small and light work.

It has a capacious fire pan mounted on a neat cast-iron standard. It thus occupies little space, and, being self-contained, can be readily moved about. It is provided with the Buffalo Forge Company's anti-clinker revolving ball tuyere, and, by means of adjustable slides, either a deep or a shallow fire can be carried as desired. It has coal box and water trough, and racks for tongs, etc., are provided on both sides. The blast-gate is air-tight, and is worked by a lever placed conveniently near the smith's hand.

The ashbox extends down inside the standard.

Forges of this pattern are used in many technical colleges, including the Sibley College of Mechanical Arts, Cornell University, the Atlanta University, the manual training schools of Toledo, Chicago and St. Louis, and others. It is also used by many manufacturers, including the Studebaker Manufacturing Company, South Bend and Chicago, the Abbott Buggy Company, of Chicago, and Messrs. D. W. Haydock & Company of St. Louis.

Any further particulars can be ascertained on application to the makers, the Buffalo Forge Company, Buffalo, New York.

Boston Passenger Travel.

Out of the 60,000,000 passengers carried by the eight Boston roads in the year ending Sept. 30 last, 38,225,687 were brought into and carried out of Boston. In this city traffic the northern roads prove their superiority, their total number being 20,416,900, or 2,606,113 more than the southern roads carried. The Fitchburg appears to show the largest relative gain of any road. The northern roads brought more passengers into the city than they carried out, while the southern roads carried out more than they brought in. It will be seen from the table below that over 3,000,000 more persons went in and out of Boston by rail than the year preceding;

PASSENGERS TO AND FROM BOSTON.

	Inward.	Outward.	Total.	Increase over 1885.
Northern roads:				
Boston & Maine...	5,496,045	5,511,934	11,007,979	554,142
Boston & Lowell..	2,385,116	2,337,886	4,723,002	447,497
Fitchburg.....	1,513,882	1,508,761	3,022,643	500,786
Revere Beach (narrow gauge).....	840,092	823,184	1,663,276	232,914
Total....	10,235,135	10,181,765	20,416,900	1,730,339
Southern roads:				
Boston & Albany..	2,944,147	2,944,546	5,888,693	319,251
Old Colony... ...	2,501,309	2,528,734	5,030,043	341,774
New York & New England..... ..	1,156,751	1,142,812	2,299,563	251,845
Boston & Providence.....	2,269,165	2,321,323	4,590,488	366,018
Total..	8,871,372	8,937,415	17,808,787	1,278,888
Total for 8 roads..	19,106,507	19,119,180	38,225,687	3,009,227

It is probable that very few people have any idea of the number of trains that daily enter and leave this city, and when one reflects that more than 370,000 passenger trains run in and out every year, while over 21,000 of them run on Sundays, an idea of the immense traffic can be obtained. From 900 to 950 passenger trains enter and leave this city every week day between the hours of 5 a. m. and 11:30 p. m., while every Sunday from 217 to 268 trains (according to the season) are run. In these days of enforcement of Sunday laws, it may be noted that, out of the passenger trains run on Sunday, all but two are run in violation of law. By a special law the Railroad Commissioners are empowered, at the request of any railroad, to authorize the running of "through" trains on Sunday. The Fitchburg road is the only one which has asked for action by the Commissioners, and perhaps that road would not have done it had not the state of Massachusetts owned a portion of the road over which it desired to run through trains. Appended are figures showing as near as possible the number of trains run by the several roads each day:

NUMBER OF TRAINS OUT OF AND INTO BOSTON.

	Winter. Daily.		Winter. Sunday.		Summer. Daily.		Summer. Sunday.	
Northern roads:	Out.	In.	Out.	In.	Out.	In.	Out.	In.
Boston & { West. Div....	57	57	17	19	58	58	17	17
Maine..) East. Div.....	49	49	12	12	59	59	24	25
Boston & Lowell.....	73	74	15	15	76	76	16	16
Fitchburg	48	50	16	16	49	51	16	17
Boston, Revere Beach & Lynn..	26	27	13	13	32	33	21	22
Totals..... ..253	257	73	75	274	277	94	99	
Southern roads:								
Boston & Albany.....	68	67	16	16	68	67	16	16
Old Colony.....	53	53	7	7	60	59	10	10
New York & New Eng...	25	26	5	5	25	26	5	5
Boston & Providence.....	51	50	6	7	51	50	6	7
Total..... ... .198	196	34	35	204	202	37	38	
Total for eight roads...451	453	107	110	478	479	131	137	

Although there is such an enormous number of passengers carried in and out of the city during the year, when the number is divided by the number of trains, it is seen that none of the roads carry very full freights on the average. Of course, the inward suburban trains in the morning and the outward trains late in the afternoon are crowded, but the return trains, it should be recollected, are run nearly empty. The Boston & Maine averages the highest number of passengers to a train, so far as Boston traffic is concerned, but it carries only 153 persons to a train, barely enough to fill three cars. The Boston & Providence carries 143; the Old Colony averages 142½; the New York & New England comes next, with 140; the Boston & Albany is fifth, with an average of 134; the Boston & Lowell averages only 98, the Fitchburg 93, and the Boston, Revere Beach & Lynn comes last with 85½. When it is recollected that the average rate of fare on these

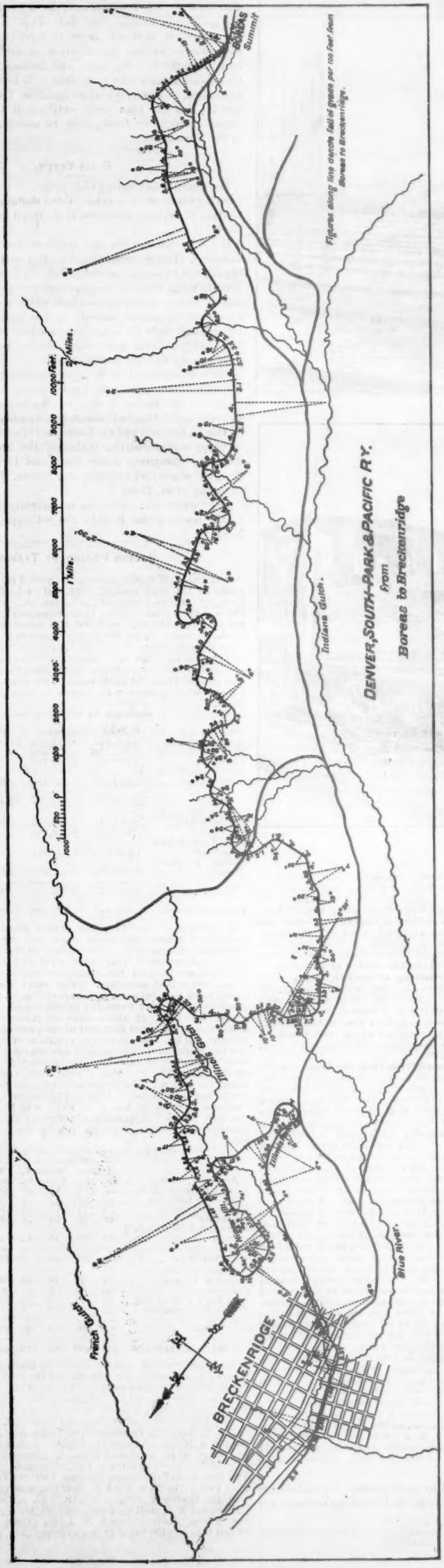


FIG. 1.—LOCATION MAP OF THE DESCENT FROM BOREAS SUMMIT TO BRECKENRIDGE.
The View in Fig. 4 is taken from the right angle in the line nearly south of "Illinois Park."

roads is only about 1.82 cents per mile per passenger, the claim of the companies that fares are as low as they can afford appears to have a little foundation. Still, it is undoubtedly true that the lower the fares, the more will people ride. If they would only ride at such hours as to enable the roads to fill all their trains both ways, the companies could easily reduce rates very materially.—*Boston Herald.*

The Descent from Boreas Summit to Breckenridge on the "High Line" to Leadville.

It is an unfortunate fact that it is very difficult to give by printed descriptions or illustrations any correct idea of the success with which one of the most difficult and responsible of engineering duties has been met—carrying a line at moderate cost through rugged and difficult country. Except for this, the railroads of Colorado would probably long ere this have been made the subject of elaborate technical descriptions and reports, whereas, in fact, they have hardly been touched upon in a technical way, or except as subjects for the often ill-directed admiration and wonder of tourists.

Yet there is probably no system of roads in the world which are so well worthy of the study of engineers, because of the marvelous cheapness with which they have been carried through the most forbidding regions, and certainly as good an illustration as any of what has been done in this way is the "High Line to Leadville," on the Denver, South Park & Pacific Railway, now a part of the Union Pacific system. The total cost of this line was, as nearly as may be, $20,000 cash per mile, and this was likewise very close to the cost of the short section shown in the large map in fig. 1. The precise figures could not now be ascertained without a good deal of trouble, if at all, but the figure stated is not very far out of the way.

For this sum the line was carried over three summits over 11,000 ft. high, two of which are shown in fig. 3, and for a large part of the remainder of the distance was carried

Fig. 2.—Map of the "High Line" from Denver to Leadville.

(*The section of line shown by profile in fig. 3 is indicated by the heaviest line above.*)

through the narrow and tortuous channel of the Platte Cañon, where long stretches of the work are in solid rock, and where fills were impossible, it being necessary to support the line on retaining walls when not in the solid. These retaining walls are among the most interesting engineering features of Colorado railroading. They are dry and very cheap, but very solid, and, we believe, give no trouble. They were generally the first work started, and were carried along as far as possible before the rock excavation was begun.

It is a safe prediction that in the hands of engineers not driven to economy by necessity and constructing by what have been regarded as orthodox standards, these works would have cost four or five times what they actually have, while many of them would have been wholly impossible at any cost. In fig. 1 we have clearly before us the open secret of their economy, or at least the chief cause of it—the comparatively free use of very sharp curves. On the 11.2 miles shown in fig. 1 there are in all 127 curves, or 11.3 curves per mile, divided as to degrees as follows:

1°..... 0	9°..... 1	17°..... 1
2°..... 6	10°..... 14	18°..... 0
3°..... 3	11°..... 2	19°..... 1
4°..... 0	12°..... 4	20°..... 25
5°..... 4	13°..... 1	21°..... 1
6°..... 7	14°..... 3	22°..... 1
7°..... 1	15°..... 4	23°..... 0
8°..... 13	16°..... 4	24°..... 24
		25⅛°..... 1
Total..... 40	Total..... 33	Total..... 54

Strike out all curves sharper than 10 degrees (573 ft.

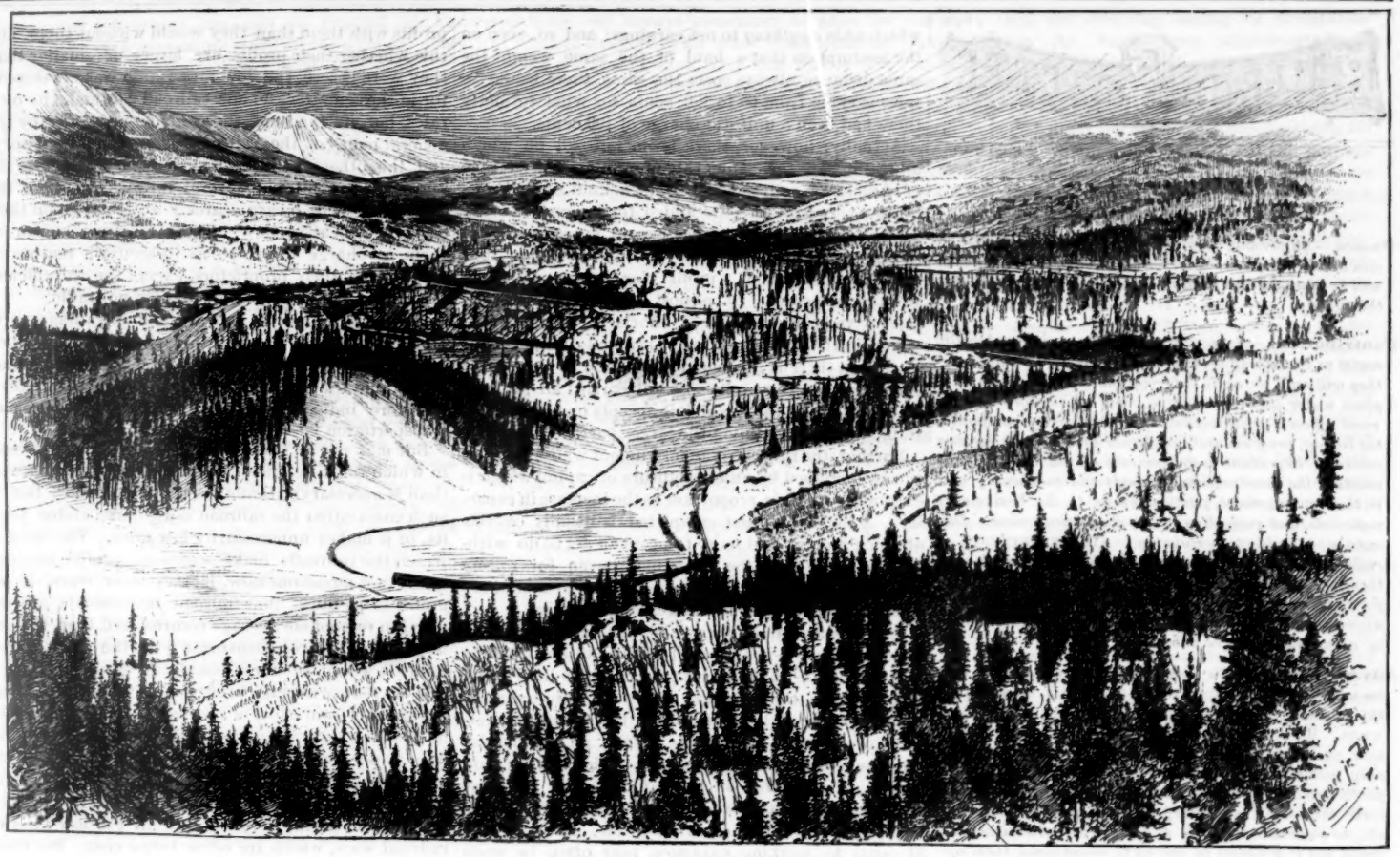


FIG. 4.—VIEW OF DEVELOPMENT AROUND "NIGGER HILL, NEAR BRECKENRIDGE, COL.
"High Line" to Leadville, Union Pacific Railway (Denver, South Park & Pacific).

radius) from this list and we multiply the cost by at least four or five at once, besides which, this particular line becomes wholly impossible, since the turn could not have been made around "Nigger Hill" nor in "Illinois Park" in the centre of the view. A far steeper grade or an entirely different route would therefore have had to be chosen.

This being so, it becomes interesting to note that one rides over these curves without the slightest sense of insecurity or danger, nor have they proved to be especially dangerous in operation. The motion around them is as smooth as around the 6-degree curves which so many engineers were formerly disposed to look upon as the ultimate limit for first-class work, and which have been held to at such large expense on so many lines of really very thin traffic. The Westinghouse pressure retaining valve is used on all trains, both freight and passenger, in descending these grades and works to a charm. The train is always under control, and there is no difficulty in handling it down the grade at nearly uniform speed. The rail and wheel-wear likewise, we are told, is by no means excessive, although, of course, far larger than it would be on a prairie road, and certainly the track was in admirable condition last summer.

These roads (for there are many like the one we have described in Colorado) are narrow-gauge, it is true, but although that fact probably gave courage for the construction we describe, it is now generally admitted that it had really very little to do with its practicability or success. Curves far sharper than these, of standard gauge, are operated by immense numbers of trains with entire success, and there is nothing whatever required to change these roads to standard gauge but to throw out the rails, lengthen the axles, and lay somewhat longer ties as fast as convenient. This fact is now very generally recognized among the railroad men of Colorado, where the narrow gauge has few defenders left, and it is only a question of time when the roads will be changed precisely as we describe, as it is already under contemplation for a large proportion of the mileage, and only the lack of the necessary funds prevents the work being begun at once.

The view in fig. 1 is reproduced from one end only of a superb panoramic photograph by Jackson, which is one of the greatest successes of the world's greatest landscape photographer. It is made up of three distinct negatives, matched so nicely that only the closest scrutiny can detect that it is not from a single negative. The track lies some little distance back of and considerably higher than the foreground of our view, and a straight line drawn across it and across "Nigger Hill" cuts the line in six distinct places at different elevations, besides cutting an irrigation ditch which starts from the little trestle seen just inside the track in the loop in Illinois Park, and then follows around "Nigger Hill" below the railroad track by what looks to be another railroad grade. The picture rather softens than exaggerates the roughness of the country, and while this is perhaps the finest single view on the line, the entire length of the line from Denver to Leadville must certainly be ranked among the most interesting and picturesque trips by rail in the world.

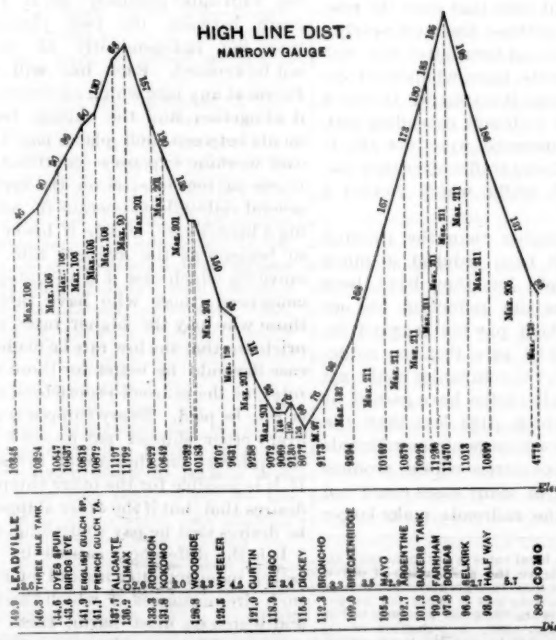


Fig. 3.—Profile of the Last 62 Miles of the "High Line to Leadville."
(Grades indicated in feet per mile.)

A New Automatic Electric Signal.

The Boston & Lowell Railroad is experimenting, between the West Somerville and Arlington stations, with an ingenious and novel signal and danger alarm for use previous to its general adoption, provided its operation is satisfactory. The invention consists of a generator of electricity, placed on the engine, and connected with the rails by a suitable device to convey the electric current from the generator. In the cab of the engine is a gong or target, which will ring a safety signal, if the tracks are all clear, the rails in place and not broken at any place, the switches and draw-bridges all closed and locked, when a train is entering upon a section of the road. Should there be any displacement or obstruction upon the track, the gong will sound a danger signal, and a target will appear before the engineer, showing the words "danger slip," and the target will remain at danger until the trouble is removed, or until the entrance is made on the next section, when it returns to safety. At no time can an engineer approach danger except at a distance in which he can stop his train or bring it under perfect control. Another new and important feature in the invention is that all switches and draw-bridges are locked by the train immediately upon entering the section where they exist, and they cannot be opened until the train has passed.—*Electrical Review*

Coal and Iron in Southwest Virginia.

The building during the past year, by the Norfolk & Western Railroad Co., of its New River Branch down into the great Cripple Creek ore fields of Southwest Virginia, has brought a number of Northern capitalists into the state and caused the transfer of large tracts of ore property along the line of this new branch. Several new companies have already been organized for the purpose of developing the field. One of the new organizations is that of the Pulaski Iron Co., with A. J. Dull, of Harrisburg, Pa., President, and Abram S. Patterson, of Philadelphia, Secretary and Treasurer. They have purchased a large ore property on Little Reed Island on line of the Cripple Creek Branch, and have already contracted with J. P. Witherow, of Pittsburgh, to build a 125-ton coke furnace at Pulaski. The Witherow people were on the ground last week to stake off the plant, but the severe snow storm stopped operations. Mr. W. C. Bullitt and others of Philadelphia recently purchased the Foster Falls or Pearce charcoal furnace property, 1,200 acres, at a cost of $150,000. He also bought the Norman or Noble property, including the Wythe Furnace, embracing 4,000 acres, for $130,000. Another large and important organization is that of the Hematite Iron Co. with George T. Mills, of Philadelphia, President, and David W. Flickwir, of Roanoke, Va., Secretary and Treasurer. This company has purchased a large tract of valuable ore prop erty opposite Foster Falls on the new line, and is preparing to open at once. The ores in this district have been in use for many years by the 16 small charcoal furnaces located in the district, where the very best of car-wheel iron was made, and then hauled by teams long distances to railroad stations and shipped to market. It is the general belief that the new companies coming into this district with abundance of capital will ere long replace the old charcoal plants with large coke furnaces. The locating of a 125-ton furnace at Pulaski, leads to the belief the other large companies will not be far behind the Pulaski Iron Co. in locating coke furnaces on their property. The official records show that transfers have been made during the past few months along this new branch of ore property aggregating $711,000.

The development going forward in the Cripple Creek District, with fair prospects of the construction of coke blast-furnaces there, has caused a boom in coke-oven building in the great Flat Top coal fields. Every company now operating there is building or preparing to build coke ovens. The new furnace companies will naturally draw their fuel supplies from this district.—*Laward's Coal Trade Journal.*

RAILROAD GAZETTE

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TRANSPORTATION PRINCIPLES AND LEGISLATION.

The provisions of the new inter-state commerce bill give occasion for a restatement of some of the fundamental principles which govern the business of railroad transportation, and differentiate it from nearly all other kinds of business, an understanding of which is required before there can be any fruitful discussion or rational legislation on the subject, but which are not generally apprehended, and are very rarely formulated by those who apprehend them. The railroad managers know that certain conditions everywhere existing compel them to make great differences in rates under different circumstances, not only for the benefit of the owners of the railroads, but for the advantage of the community which the railroads serve. They point out numberless facts which compel them to make these differences, and clearly justify their policy in special cases. But the public remains struck by the *greatness* of the differences. No differences so great are possible in most of their industries, and they are apt to feel that, however necessary it may be to have differences, the limitations of them which are proposed must still leave ample room for what are necessary and just.

One particular in which railroad transportation differs from most other industries is that the cost of the machinary for doing it—the capital invested—is necessarily so great that the interest on it forms a very large part of the whole cost of the service. On the average on the railroads of the United States last year, the cost of doing the work, aside from this interest, was less than 65 per cent. of the earnings, and yet the other 35 per cent. made but 6½ per cent. on the *debts* of the companies, leaving nothing for their $3,800,000,000 of capital stock. Everywhere this is the case; a very large part of the gross earnings of all railroads in all countries goes to pay interest on the capital invested in them. Now, in every industry where this is the case it is for the advantage of the investor to secure *additions* to his business which will not require additions to his investment, at any price which exceeds the resulting addition to his working expenditures. If we imagine a case where absolutely the whole of a railroad's traffic pays the same rate of profit, and 35 per cent. of the receipts pays reasonable interest on the cost of the investment, then the natural tendency of the investor is to look for other traffic, such as could not be done at a profit to the shipper if for every 65 cents of cost he had to pay 35 cents towards interest. And in every community where there is any variety of industry or circumstances he finds traffic which will be offered at all sorts of lower rates. Some will pay 34 cents above working expenses, and some not more than 1 cent. The wise investor accepts *any* addition to traffic which adds *anything* to net earnings; and so, even on the assumption that a haul of the same weight the same distance always costs the same, there would be rates varying from 66 to 100 cents for what formerly there had been a uniform charge of 100 cents.

Actually, however, there is no railroad on which all traffic pays the same rate of profit. The average of American railroads, 35 cents net out of $1 gross, or an average of 54 cents added for interest to every dollar of working expenses, is an average of rates which yield probably from nothing to three, four or five dollars of profit for every dollar of working expenses. In almost every case the low rates have been the result of efforts to secure traffic which in their earlier days the railroads did not have at all, and there is not one in the land which could earn a fair interest on its cost if it carried all its traffic at the lowest rates which it accepts on a part of its traffic—sometimes much the larger part.

Further, the railroad is an instrument whose capacity can be increased by an expenditure of capital which is extremely small in proportion to the increase in capacity. A railroad as first completed is usually capable of doing a great deal more than it can get to do without any increase in the investment, even for rolling stock; but in any case the additions to capital are small in proportion to the increase in capacity.

Still further—and a fact which has a tremendous influence on rates—in almost all cases additions to traffic do not increase *working expenses* correspondingly, and in many cases they increase them very little, as in the familiar case of loads taken in the opposite direction to the main course of traffic, and as is also the case with traffic in both directions at certain times. Thus *additions* to traffic, similar to those which cost on the average one dollar for working expenses, and contribute on the average 54 cents to working expenses, may often be made which will not cost more than 75, 50 or 25 cents for working expenses and add nothing to the interest account. Skill in railroad management consists very largely in utilizing the opportunities for developing traffic which costs less than the average to carry and adds little or nothing to the interest account, and this means that additions to traffic be taken at any rate necessary to secure them which adds more to earnings than it does to expenses. All such additions are advantageous to the railroad owners, and of course to those who make the shipments at reduced rates (else they would not make them).

Are they injurious to the other shippers who pay the higher rates? Certainly they do not pay higher rates because of the shipments at lower rates, and certainly it is possible to pay the same interest on the investment with a reduction of the higher rates equal to the whole amount of the profit on the traffic at the lower rates. It is true that the railroad companies do not make the low rates for this purpose. They make them in order that they may *add* something to their profits. But what is the effect? A case can hardly be named in which the highest rates have not been reduced, sooner or later, when another business attracted by lower rates has added sensibly to profits. It is true that the charges on a large part of railroad business are not so directly and quickly limited by competition as the prices for most other commodities and services, but it is also true in almost all cases that even the rates on the traffic of which a railroad has most nearly a monopoly have to be reduced not long after the railroad has had aggregate profits, from whatsoever derived, much above the average investments in which the risks are similar. The railroads extending eastward from Chicago, for instance, were not able to maintain their old rates on local traffic after they had developed a heavy through traffic which yielded a considerable profit.

The local rates remain higher than the through rates, and perhaps have not been reduced so much (though possibly they have*), but they have been very largely reduced, and as this reduction has occurred on several roads which pay but beggarly interest on their cost, we may be sure that the reduction has been made because the companies could not help it. Thus we find that all parties have gained by the acceptance of traffic which pays less than the average profit. The other customers of the railroads pay less because of it; the industries whose produce is carried at the low rates in many cases could not exist without them; and the railroads make larger profits with them than they would without them, and this whether their profits are larger or smaller than they were before the low rate traffic was developed; for in these matters no one railroad can make its own rates, but must accept those made necessary by the general policy of the railroad system in its territory, and the other facilities for transportation, as the extremely low rates of several railroads south of the great lakes, which earn scarcely any interest on their cost, very clearly show. There is every reason for them to charge more, so as to secure a reasonable interest for their proprietors, except the all-sufficient one that at higher rates they can get no traffic.

It is therefore proper and just and advantageous to all concerned that some traffic should pay a much smaller profit over working expenses than other traffic, and the existence of great differences in rates is therefore indispensable to the rational conduct of transportation business.

But may not all this be and yet there be many cases in which the differences are unnecessary or greater than is necessary? Doubtless this is possible. But in such cases either the railroad must make undue profits, or it makes unnecessarily low rates. The cases in which the railroads make excessive profits are certainly not numerous now, if they ever were, if we grant, as we must, that railroad investments are entitled to reasonable average returns, and that the interest should be commensurate with the risks. Certainly it would be unreasonable to establish general rules to reduce average profits on $1,000,000,000 worth of railroads from 5 to 4 or 3 per cent., because some one railroad with $50,000,000 of capital was making 10 or even 20 per cent.; and it is probably not necessary to argue that railroad proprietors do not make rates lower than they think necessary for their own interests, present or future, including all the low rates of railroad wars, which are often below cost. But there are very many cases in which rates are made lower than the necessity of those who produce and consume the goods require, or the natural situation of the places which enjoy them, simply because of the rivalry of the railroads themselves. Corn from Kansas or Nebraska must be carried cheaply to Chicago or other lake port, because at a rate as high as the reasonable average rate it cannot be produced at a profit so far from the consumers. Wheat or corn or flour must be carried by rail at still lower rates from Chicago or Duluth to the Atlantic seaports, because at any rate much above the cost of transportation it will all go by lake or canal. Anthracite coal may properly be carried from the Pennsylvania mines to Chicago and towns in Iowa and Nebraska at rates below the bare cost of moving the train and making good the wear and tear due to it, because in the first place no more can be got for the transportation, and, in the second place, the train must be hauled west to get grain, cattle and provisions, whether the cars are loaded or empty, and the cost if loaded is but little more than if empty; but these reasons do not apply to cases where rates are higher from a place 20 miles or more east of a western railroad competing point (say Peoria) to a place 20 miles or more west of an eastern railroad centre (say Columbus), than between the two railroad centres themselves. The low rate between the railroad centres is the result of competition among the railroads precisely as if there were a water route between the two places, and so long as they act independently of each other it cannot be avoided. Each line will take freight out of Peoria at any rate which exceeds cost, rather than lose it altogether, and the natural tendency is that shipments between such places pay but the merest trifle over working expenses—contribute almost nothing towards paying interest on the investment—unless the several railroads co-operate in making and maintaining a higher rate, which if lower than the average is so because at the average rate the traffic will not move (in which case it is advantageous for all parties concerned—those who have this traffic to forward, those who pay the higher rates, and the railroad proprietors—that the low rate be made); while in the other case it would be better for those who pay the highest rates, or the railroad proprietors, or both, that a higher rate be paid. Every shipper is interested in having every other shipper pay *as much as possible* towards the interest on the capital invested in the railroads. If it is possible for the other shipper to pay much, he desires that, but if the other shipper cannot pay much, he desires that he pay something, even if a very little.

It is the differences caused by railroad companies acting independently instead of co-operatively under such circumstances of which there is most complaint, and which do most harm, these including different rates to different shippers at the same time. The other differences are inevitable, and in most cases (but not always, by any means) are seen to be so. Bu

* The extent of the reduction in local rates is not generally appreciated because its effect is to leave the percentage of difference between the through and the local rate greater than before. Thus, when the average through rate was 2 cents per ton per mile and the average local rate 3 cents, the local rate was but 50 per cent. greater than the through rate. A reduction of 1½ cents in both rates leaves the through ½ cent per ton per mile, and the local 1½ cents, the latter being 200 per cent. more than the through rate, where formerly it was but 50 per cent. higher, though the amount of the reduction has been the same in both cases, and the *amount* of the difference remains the same.

the first-named differences can only be avoided by the railroads at each competing point acting as one.

Now, it is in this direction that we have been tending. We have had besides all the necessary and desireable differences in rates a vast number of unnecessary and harmful ones, which the railroads have been learning how to escape, and are now escaping, by co-operation, to an extent never known heretofore. We believe that it is true that *all* the traffic covered by the pooling agreements is that carried at less than average rates. If not all, then all but an extremely small fraction of it is such traffic. Most of it is carried at rates which are lower than any known in any other country. How can the community suffer by a policy, the whole purpose and tendency of which is to make through rates uniform and steady, if it does not make them unreasonably high? As a fact, we think we are safe in saying that the actual effects of pooling have not been complained of. Every complaint that we have seen has been because the policy was not extensive enough, or was not carried out as agreed, and it is more and not less pooling that would be the remedy. The comments that sometimes are made on the subject show a profound ignorance of the facts in the case. Pools, imperfectly executed as they have been, have reduced the objectionable differences in rates, and have lessened the fluctuations in them. They are full of promise of good. It is perfectly proper that the community should provide against their making rates unreasonably high, which can only be done by something like a judicial tribunal, since intelligence must be exercised in every particular case; but to prohibit them altogether is to arrest a natural and wholesome development of American railroad policy, which bids fair in time to secure very great advantages to the community. We shall never get the whole benefit of our railroads until they are in many respects worked as one system, and there is good reason to believe that the advantages of unity (many of which are not now even aimed at) will be secured by the voluntary co-operation of the railroads, without the disadvantages which result from putting a whole national system absolutely under one management in all its operations. The railroads may be trusted to discover and bring into use what will enable them to do the work of transportation with least cost to themselves, and the public is entitled to have its representatives authorized to prevent any policy which, with the railroads all co-operating, would make it pay unreasonably high rates; but to put an end to the machinery, laboriously developed, by which we have been making progress in directions desired by the community as well as the railroads, will be a grave mistake.

GOING BACK TO FLAG.

One of the toughest snags encountered in the discussion at the October Time Convention was the rule (No. 101 and its auxiliary clauses, Nos. 98, 99 and 100) concerning the sending back of brakemen to prevent rear collisions. The difficulties in the way of attaining uniformity, the great variety of views, and the impossible things necessary to be accomplished before perfection can be secured, nowhere obtruded themselves so prominently or refused so persistently to be settled. The best roads acknowledged some of the poorest practice, and the wisest managers were as vague and indefinite as were the lesser lights in proposing remedies. One of the two vital points in the application of the principle, the question when to call in the man who has been back with signals, had to be omitted entirely, so great was the difficulty in harmonizing the conflicting views.

The committee was obliged, in the nature of things, to confine itself to the selection and presentation of the results of experience simply. The convention was no place to bring forward new and untried theories, however good and promising they might be. If any such were so brought in, their rejection by the convention would be a question of only a very few minutes; and doubtless every one recognized this. But, in spite of all these things, notwithstanding so many conscientious, sagacious and hopeful men have gone home unsatisfied, the path of improvement is still open, and no one need sit in the rear end of a passenger train and tremble every time the car stops, *simply* because the superintendents have apparently decided that they don't know when to send a man back, or how long to keep him there when he has been sent. Some of these very officers now laboring under such unsatisfactory rules will yet discover and apply important principles which are now little understood (and heeded still less), and American energy and enterprise will not always rest silent under the monstrous record of rear collisions which now disgraces us. These officers are certain to make marked progress in this direction if they persevere in living up to their best convictions, and always remember to place the safety of life and limb above all other considerations.

Now, while we by no means offer our indoor wisdom as a substitute for the practical knowledge which these active superintendents possess, there are a few important points that should be kept in mind when this subject is considered, which appear to have been in a large measure overlooked at the convention; and these we wish to speak of.

There are important *limits* to be observed in securing safety to trains, as in nearly every other railroad problem. It is impossible to make an intelligent rule for a flagman without having some limit as to the speed with which trains are permitted to follow him. If trains are to be allowed to run at such a speed that they cannot be stopped within two or three miles, as one superintendent said was his practice, there is manifestly no safety at all in running less than half an hour apart; unless indeed with block signals, which the uniform code cannot at present contemplate. If the steepness of the grade is to enter into the brakeman's calculations, whenever he sees fit, complications will constantly arise. What right has he to assume that in going up hill all trains will move slowly? An engine with one or two cars can ascend a 90 ft. grade at 50 or 60 miles an hour with ease, as every one knows. The fact that it is not often done should have no weight at all. We observe that in Rule 98 the committee does commit itself, apparently, to the doctrine that half a mile is a reasonable distance in which to stop a train; why not make this a rigid and universal limit to be always observed? It would sometimes waste time probably, as for instance in the case of a passenger train which happened to be without a power brake; but it would simplify matters greatly.

Depending on the approaching engineman's seeing a train on a tangent is not an infallible preventive always; he will spend a good many seconds sometimes in "trying the gauges" or doing some other little thing inside the cab while the engine is rapidly moving directly toward a red light that might be seen if looked at. If the flagman is to go back at all, should he not go far enough to place a torpedo at a safe distance, or to be able to throw a stick at the runner's head in case of necessity? This contingency, though perhaps remote, is by no means beneath notice.

Rule 99 leaves room for the flagman to make a mistake of judgment as to the density of a fog or the distance at which a red light can be seen through a thick snow storm; and the convention did not even make an attempt to clear up this and cognate points, or to relieve the flagman's shoulders of even a portion of the burden. Certainly the diminution in the number of rear collisions is not so rapid as to warrant the most boundless confidence in the present mode of providing against them, and it would seem as though the convention might find both instruction and profit in dissecting the subject a little further. If additional safety can be secured by shifting some of the responsibility upon the division superintendents, quite likely it will be the managers' duty to make the change. Why not, instead of using the term "usual stopping place,' which is somewhat indefinite, have an official list and clear designation of what are, and what are not, stopping places? We could imagine a road where it would be both feasible and convenient to have all freight trains reduce their speed to a controllable rate at all stations, and to have all passenger trains reduce their speed more or less at the few large stations; this much allowed and provided for, the matter of rear-flagging is greatly simplified. If a freight train can, at most of its stops, be made to feel perfectly safe without a flag, a great relief will be experienced and a clearer field left open for the inculcation of proper rules concerning flagging at other points. If roads are forever to run without block signals, and desire to attain a reasonable degree of safety in operation with present appliances, some sacrifice must be made elsewhere to offset the lack of the needed improvements. It is unreasonable to try, on a poor road, to give a train the right to proceed for long distances without any care as to the train ahead of it. It makes life too much of a burden for the men of the leading train. Occasional places—every station, or a half, or a quarter of the stations—should be set apart as "cities of refuge" where, under limitations, conductors can feel at ease; and, if they have been obliged to drop off one or two flagmen during the previous dozen miles they can in an emergency wait for them to be brought in. If the principle be allowed (as applied to our imaginary road), it is not entirely impossible that a real road can be made to approximate more or less closely to the ideal. It will be objected that constant carefulness in approaching way stations and sidings, where there is usually no obstruction, would be a difficult thing to enforce; that the everyday taking of precautions which prove to have been unnecessary will make trainmen unruly, and require an unreasonable amount of supervision; but could it make matters any worse than they are now? Failures are frequent enough under the ordinary plan of waiting till trouble appears before disciplining the men; perhaps division superintendents ought to experience some change that would compel them to follow up their men more closely. Trains are brought under control at thousands of drawbridges, city stations and similar places daily throughout the country, and rules covering these points are obeyed with a comparatively small proportion of lapses. Who will say that it is impossible to enforce the same carefulness at water tanks and small stations? The principle of "watching out" every time, whether there be danger or not, is necessary in other departments. Why not invoke it here? Engmemen have to look for danger at switches thousands of times, and find only safety. Switch tenders have a similar hard duty. It may be said that station-limit posts or other appliances would be required, and that therefore many roads would object, not being ready to adopt innovations in material things; but uniformity ought to be worth *some* sacrifice; those who desire it only on paper cannot have a very exalted notion of its value. If we really want to be right, let us strive after it courageously.

Just how much dependence may be placed upon a torpedo seems to be a subject on which more light is needed. We find no positive statements in the report of the discussion, but the tenor of the rule seems to imply that with two torpedoes properly placed, it is comparatively safe for the flagman to return to his train at any time. The danger of being run into is certainly as great at the moment the flagman completes his return journey as it is at any other time, and if entire dependence *cannot* be placed upon the "detonators" the superintendents ought to acknowledge the fact and provide against it. Then again, the extent of track which a torpedo signal protects ought to be very definitely stated. When an engineman is cautioned by one of them to proceed with care, how far is he to go before resuming full speed? And in reducing speed, how large a dose of reducing medicine is he to apply? Suppose he is running only ten miles per hour already? To a runner who deems it his first duty to arrive at a point fifty miles away in fifty minutes these are important questions.

The chief half of our subject, calling in the flagman, must be deferred, as space forbids our shouting to him here.

Growth of Flour Exports at Baltimore and Boston.

Baltimore is again receiving large quantities of flour. In the month of November last its receipts were 222,264 barrels, against 72,690 at Philadelphia, 319,649 at Boston and 582,585 at New York. The exports from Baltimore in that month were larger than those from Boston even, which is unusual. The flour exports from the several Atlantic ports of the United States in November for four years have been, in barrels:

	1882.	1883.	1885.	1886.
New York	390,786	356,148	277,052	352,551
Boston	165,944	162,558	140,319	176,463
Philadelphia	32,6 8	72,155	38,831	14,564
Baltimore	49,717	44,079	40,120	186,964
New Orleans	15,992	3,370	1,588	1,532
	655,047	638,010	497,910	732,074

Thus the exports from Baltimore last November were nearly four times as large as in any of the other three, and its gain has been made at the expense of New York and Philadelphia, Boston having gained.

The result in a single month is not sufficient to establish a great change, but below we give the exports for the five months ending with November as follows:

	1886.	1885.	Inc. or Dec.	P.c.
New York	1,504,467	1,274,560	+ 229,907	18.0
Boston	1,072,861	687,624	+ 385,237	56.0
Philadelphia	126,790	164,652	— 37,862	23.0
Baltimore	901,172	243,377	+ 657,795	270.0
New Orleans	23,919	7,689	+ 15,270	199.0
Total	3,629,249	2,377,902	+1,251,347	52.6

Thus there has been an increase of more than 50 per cent. in the total exports for the five months, but more than half this increase was at Baltimore, which exported 3.7 times as much as last year, while there was a large decrease at Philadelphia. The gain at Boston was slightly more than the average gain, but at New York it was much less, Baltimore having diverted business from it as well as from Philadelphia.

Baltimore had large flour exports for the first time in the first half of 1885. For the entire year until 1885 they had but once been as much as half a million barrels, namely:

Year.	Barrels	Year.	Barrels.
1875	453,107	1880	486,891
1876	426,094	1881	413,923
1877	364,981	1882	463,878
1878	503,766	1883	439,266
1879	393,748	1884	437,718

In the first half of 1885 these exports suddenly rose to 787,413 barrels; in the second half of that year it was the] failure of the winter wheat crop, probably that brought them down to 305,680 barrels—still much more than its average had been. For the eleven months ending with November its exports this year have been 1,505,645 barrels, which is 474,837 barrels (31¼ per cent.) more than last year, and more than three times as much as in the whole of any previous year except 1878. Until 1885, New York and Boston were the only important export markets for flour. In 1883 and 1884, for instance, the exports were :

	New York.	Boston.	Phila.	Balt.	The four.
1883	4,441,153	1,766,172	363,342	439,266	7,009 933
1884	3,907,021	2,173,842	334,134	437,713	6,852,710

Boston had already been gaining for several years at the expense of New York, as the following statement of their exports shows :

	1878.	1879.	1880.	1881.	1882.
New York.	2,811 836	4,230,242	4,220,610	4,510,454	4,623,956
Boston ...	383,600	794,372	922,248	1,052,036	1,206,338

In 1875, 1876 and 1877, as well as 1878, New York exported *seven times* as much flour as Boston ; in 1870 5⅓ times, in 1880 and 1881 4½ times, and in 1882 3⅞ times, in 1883 2½ times, and in 1884 only 1.8 times as much ; for the last five months, only 40 per cent. more. But meanwhile Philadelphia and Baltimore flour exports did not grow, in spite of a great increase in total exports. But for the last two years Baltimore seems to have been making up for lost time. Of the total exports from the four ports 89 per cent. went from New York and Boston in 1883 and 88¾ per cent. in 1884, and Baltimore had 6½ per cent. in 1883 and 6⅛ per cent. in 1884. For the five months ending with November New York and Boston had 82½ per cent. in 1885 and 71¼ this year, while the share of Baltimore rose to 10¼ per cent. last year and to 24¼ this year.

This is a notable change in one of our chief exports, and one which tends to increase much faster than any grain exports, which latter, indeed, do not increase. In 1876 and thereabout Baltimore became an important exporter of corn, and it was thought then that it was not likely to be a formidable rival for the export of any other grain, but a good deal was said of the important import business likely to follow any large development of export trade. But in 1878, when we began to have large crops of winter wheat, Baltimore secured a large export trade in this year, which was much larger in 1880 and 1881 than its corn exports have ever been. And ever since when there has been a large winter wheat crop, it has had large wheat exports. For the last five months, for instance, its wheat exports were more than half as great as those of New York, and much more than those of Boston, Philadelphia and New Orleans together; while for the corresponding five months of last year, when the winter wheat crop was very poor, Baltimore exported but one-fourth as much wheat as New York. But as after many years of an established large grain export trade its flour exports did not increase, it seemed natural to conclude that this was a trade which could not be diverted from its old channels. But we see that it has been to an important extent within the last two years, and in New York, which in 1878 exported 70¾ per cent. of the total exports from these four ports, and as late as 1881 73⅓ per cent., in the last five months exported but 41½ per cent. of them. Meanwhile its share of the import trade has not increased at all.

Boiler Joints.

The *American Machinist*, in reviewing the enlarged edition of "Recent Locomotives," just published, makes no comment upon the newer and larger portion of the book, but directs its artillery, at somewhat long range, upon some remarks on the merits of butt joints in the earlier portion of the volume. The passage under fire stated that (1) the butt joint was little known in America, and (2), as used in England, was superior to the various forms of lap joints, with and without an inside welt, as used in this country. The first part of this statement was undeniably true when it was written, some five years ago, but the *American Machinist* says that it is not true, and that the statement, "butt joints are almost unknown here," "could never have come from any one conversant with American railway matters." As the statement in question was made by Mr. M. N. Forney, the *American Machinist's* criticism is somewhat wide of the mark. The second assertion, as to the relative superiority of butt over lap or lap and welt joints, is, of course, a matter of opinion ; but, as the butt joint is gaining many friends, and has been lately adopted by the Pennsylvania for its new Consolidation engines, and is in use on the new Northern Pacific Decapods now being built by Baldwin, and on the "Kitchigami," the largest Consolidation yet built by that firm, it would seem as if the advantages of the butt joint were being appreciated by many engineers who have responsible charge of large boilers.* The *American Machinist* has no such responsibility, and therefore doubtless feels safe in adhering to an older form of joint, which in some degree still possesses the inherent disadvantage of the lap joint, a tendency to distort the plate under pressure. This produces a bending action at the bending of the lap, and consequent furrowing. The use of an inside welt greatly mitigates the evil, but the best practice is to get rid of it altogether, by butting the ends of the plate and keeping it in a perfect circle, so that the pressure never tends to bend the plates. The use of two welts or butt strips, one inside and one out, effects this perfectly.

The *American Machinist* quotes a discussion on boiler joints at the convention of the American Master Mechanics in 1882. This discussion, however, took place *after* and not *before* the advantages of butt joints had been set forth in these columns, and went far to justify the preference we then expressed. In this discussion, Mr. Sedgley said : "We have boilers used for 25 years with the welted joint. * * * We have never had to repair a boiler where the seam was welted. * * * Boilers without the welt will require patching inside of three years, and will furrow completely through. * * * I look upon it as a sure cure to welt the seams."

If that statement means anything, it means that a lap joint is a bad joint, and a welted joint a good joint. But that is exactly what we contend. If the lap is bad and the welt is good, abolish the lap altogether and use nothing but welts, or, in other words, the butt joint.

Further on it was stated that "furrowing never took place above the water line." The obvious lesson is, place all longitudinal seams above the water line, and this has been urged again and again in these columns, but is constantly disregarded in many boilers otherwise designed with the greatest skill and care. It is a fact well known to all those that have had charge of locomotive boilers, that explosions rarely occur from furrowing, corrosion or weakness clearly above the water line. It is hardly correct to say that furrowing *never* occurs above the water line. When it does happen, it is generally not sufficiently deep to cause an accident, and is discovered when the boiler comes into the shop for a thorough overhaul. Joints placed barely above the water line do occasionally furrow, and to insure safety, longitudinal joints should be placed well clear of the highest water level. Modern rolling mills can produce plates up to 10 ft. wide, and of practically any length and thickness likely to be used in locomotive boilers. There is therefore no obstacle to the use of plates long enough to form a ring in a single plate. When this is possible, it is an easy matter to keep all the longitudinal joints well above the water, and in this position furrowing is practically impossible.

The 93 railroads that have reported their November earnings so far earned in the aggregate :

	1886.	1885	Increase.	P. c.
November	$30.083,639	$28,050.260	$2,033,379	7.3

Of this gain $564,931 was by the New York Central, which includes the West Shore this year and not last, and as the West Shore probably earned about $350,000 last year, the true increase was probably about $1,700,000, or 6 per cent. This, however, is a gain over a year of large gain, 91 roads reporting for November last year having earned 5.8 per cent. more than in 1884, which, however, was a very unfavorable month, in which the 79 roads reporting earned 8.9 per cent. *less* than in 1883 ; but in 1883 the 75 roads reporting earned 6.3 per cent. more than in 1882.

Of the 19 railroads reporting this week, 14 earned more than last year. No less than 16 are Southern roads. In the aggregate the gain of the 19 roads is small, but some of the roads have large gains, as 32½ per cent. by the Alabama Great Southern, 17¾ by the Nashville & Chattanooga, and 12¾ by the Richmond & Danville. Four of the other five roads in the Richmond & Danville system have gains, but they are small, and in the aggregate not as large as the loss of 18¾ per cent. by the fourth, the Greenville & Columbia. The four roads in the Cincinnati, New Orleans & Texas Pacific system all have gains, but only on the Alabama Great Southern are they large, and its earnings were exceptionally light last year.

Judge Thomas M. Cooley, whom Judge Gresham has appointed Receiver of that part of the Wabash system east of the Mississippi, is neither a railroad manager nor otherwise experienced as an executive officer, but he is a great jurist, a student of and familiar with the relations of railroads with each other and the community, a man of remarkable intelligence, and of the stictest integrity ; and all parties concerned in the Wabash property may be assured that with him in charge it will be managed with strict regard to the rights of each and all of them—for their permanent as well as their temporary interests. A great number of different interests are involved, and of course it will be for the courts and not for the Receiver to decide as to the limits of their respective claims, should they not agree : but they will all know now that the management of the property under the Receiver will not have special regard to any one of those interests more than the others—that they will all be protected alike—and that is just what is wanted in such cases, and what too often is not had.

* Butt joints are also adopted in the enormous locomotive type boilers designed by Mr. E. D. Leavitt. The inside welt is longer than the outside, and the rivets are so disposed that the strength of the joint as tried in a testing machine is 92 per cent. of the strength of the solid plate. Several of these boilers have been built by the Dickson Manufacturing Co., of Scranton, and are doing well at the Calumet & Hecla mines and other places.

The report of the British Board of Trade for November shows exports of rails to the United States which may fairly be called large, being nearly as great as for the first nine months of the year, nearly four times as great as in the whole of last year, and more than in the whole of 1884. For eight years the exports of rails to this country in November have been :

1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
9,277	15,586	15,344	4,638	6,702	1,007	35	20,639

Thus, not only were the exports to this country large in comparison to recent years, when the total for the year was very small, but also in comparison with the years of largest exports.

For the 11 months ending with November the showing is very different, the exports of rails to this country having been :

1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
37,690	203,872	275.016	188,271	66,172	16,483	5,236	50.014

Thus the quantity this year, though nine times as great as last year and three times as great as in 1884, is less than in any other year since 1879

November Grain Receipts at New York.

The grain and flour receipts at New York in November were a tenth larger this year than last, but less than in 1884, and much less than in any of the four years from 1877 to 1880. For the last ten years the total New York receipts and the receipts by rail and water have been :

Year.	By rail.	By water.	Total.	P.c. by rail
1877.....	5,833,134	12,400,217	18,233,351	32 0
1878.....	6,247,121	10,224,435	16,471,856	38.5
1879.....	6,465,673	10,806.053	17,271,726	37.4
1880.....	10.285,746	8.305,101	18,590,447	55.4
1881.....	6,604.481	6,646,432	13,250,913	49.9
1882.....	8,844.769	6,128.224	14 972,993	59.0
1883.....	6,106,143	4,999,473	11,105,616	55.0
1884.....	7,939,882	7,666,330	15,606,212	52 9
1885.....	7,303 178	5,423,686	12,726,864	57.4
1886..	7,195,394	6,827,440	14,032,834	51.3

Thus, though the total receipts this year were 1,300,000 bushels more than last year, the rail receipts were a little less than then, and less than in 1884, 1882 and 1880, and as before 1883 there were but three railroads bringing any considerable quantity, while now there are six (including the Lehigh Valley) it is evident that the movement this year, though reasonably large, yielded much less to the old roads than in some previous years. The contrast with 1880 is especially strong, the rates then being 30 and 35 cents per 100 from Chicago, against 25 this year. The New York Central, the Erie and the Pennsylvania together brought 10,235,000 bushels to New York in November in 1880, and only 4,550,000 this year.

This latter is much less than in any previous year, for a long time, the November receipts by the three old roads having been, in *thousands* of bushels :

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
5,807	6,220	6,348	10,235	6,566	8,778	5,751	6,115	6,575	4,550

Thus these roads had less support from the grain movement this year than in any other when rates were as high, and 1881 was the only year when rates in November were lower, but possibly (not probably) rates were not as well maintained in 1883 as they were last month.

It is manifest from the above that the new roads brought an exceptionally large amount of grain to New York last month. The deliveries by them in November have been:

1883.	1884.	1885.	1886
209,000	1,725,000	828,000	2,545,000

Only the Lackawanna was open in 1883; in 1884 it brought 596,000 bushels and the West Shore more than 1,100,000; last year the shipments by the West Shore were only 489,000 bushels, but this year they were 1,395,000, which is more than in any previous month except September of last year (at rate of 8 or 10 cents per 100 from Chicago). These very large receipts by the West Shore, amounting to 19 per cent. of the total rail receipts, were the feature of the November receipts. Compared with last year the figures are, for November:

	1886.	1885.	Inc. or Dec.	P.c.
N. Y. Central.	1,933,399	2.759,393	— 825,994	30.3
Erie	1,826,811	2,393,015	— 566,203	23.6
Pennsylvania.....	790,260	1,222,752	— 432,492	35.4
Lackawanna..... .	745,106	283,659	+ 461,447	162.7
West Shore..	1,394.891	489,077	+ 905,814	185.2
Other.....	504.927	155,283	+ 349,644	225.0
Total rail...	7,195,394	7,303,178	— 107,784	1.5
Canal....	6.565,502	5,036,500	+ 1,529,002	30.4
Coastwise.....	271,938	387,186	— 115 248	29.8
Total	14,032,834	12,726.864	+ 1,305,970	10.3

We see, therefore, that while the total rail receipts were nearly the same this year as last, there were very great changes in the receipts by each separate railroad—great gains by the new lines and corresponding losses by the old ones. The New York Central and West Shore together

brought more this year than last—46.4 per cent. of the whole, against 44.5 last year.

The receipts by canal this year were the largest since 1880, with the exception of 1884, and the increase in them over last year was more than 30 per cent.

November closes the canal season, but a considerable quantity which had got through to Troy by the end of that month may arrive at New York in December. There were about 500,000 bushels of it last year, but in no case can it be more than a small fraction of the season's receipts. We may, therefore, compare the canal receipts this year with those of previous years. They have been in *millions* of bushels:

1877.	1878.	1879.	1880.	1881.	1882.	1883	1884.	1885.	1886.
48.4	63.9	57.0	69.4	38.2	31 7	40 8	37.5	29.9	43.7

Thus the receipts by canal were larger this year than in any other since 1880, but smaller than in any of the four years from 1877 to 1880. They were nearly one-half greater this year than last (when they were the smallest for many years), but only 7 per cent. greater than in 1883.

The rail receipts for the *entire year* for ten years were, in millions of bushels·

1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.
59.0	50.9	85.4	101.9	95.4	98.6	79.4	48.1	75 1	93.0

For the 11 months they have been:

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
43.8	77.9	97.4	86.4	93.7	70.1	73.2	67.3	84.2	76.2

With the exception of last year, therefore, the rail receipts this year were the largest since 1881, and doubtless will be so at the close of the year. The rates last year probably averaged 8 or 10 cents per 100 lbs. less than this year for the whole time from March 1 to Oct. 10, and were somewhat lower in every other month except, perhaps, November. That under these circumstances the railroads should have had so large a grain business is remarkable. They have carried but 8 millions less than last year, while the canal boats have carried 14 millions more. The gross (and net) earnings of the railroads east of Buffalo and Pittsburgh from this traffic were certainly much greater this year than last—probably the gross was as much as 35 per cent. greater, which much more than offsets the decrease of 10 per cent. in quantity.

Provision Exports.

The provision exports in November make a more favorable comparison with last year, especially in pork products, than might have been expected in view of the Chicago strike and the great decrease in the number of hogs packed. On the other hand, there was a great decrease in the fresh and salt beef, exports and in butter, but a large increase in cheese and an immense one in tallow—perhaps because of the oleomargarine tax, which may reduce considerably the consumption of tallow here. Thus the exports of the different cattle products were, in pounds:

	1886.	1885.	Inc. or Dec.	P. c.
Fresh beef	6,710,454	7,583,179	− 871,725	11.5
Salt beef	2,667,381	3,697,687	− 1,030,306	28.0
Tallow	7,197,587	1,085,155	+ 6,112,432	563 4
Butter	785,955	1,103,785	− 317,830	28.8
Cheese	4,137,392	2,960,324	+ 1,177,068	39.8
Total	21,498,769	16,430,130	+ 5,068,639	30.8
Value	$1,652,196	$1,419,068	+ $233,128	16 4

Besides the above, 2,923,493 lbs. of canned beef were exported this year, and probably about the same quantity last year. The quantity was not reported then, but the value of the canned beef exported was about one-eighth more than this year, which is about equal to the decrease in prices of other salt beef. There were also exports of live cattle equal in value to about three-fourths of the fresh beef, and in number 21 per cent., and in value 11 per cent. more than last year, and the aggregate value of the live cattle, beef, table and dairy produce was:

	1886.	1885.	Increase.	P. c.
November	$2,316,504	$2,053,867	$262,637	12 3

The exports of pork products were 27 per cent. more in quantity and 20 per cent. more in value than last year, but here again we are struck by the fact that nearly all the increase was in lard; there was a large decrease in bacon, the other large pork product, the figures being:

	1886.	1885.	Inc. or Dec.	P. c
Bacon	25,956,839	31,526,763	− 5,569,924	18.0
Hams	4,030,329	3,963,715	+ 66,614	1.7
Fresh and salt pork	5,079,136	5,247,530	− 168,394	3.2
Lard	47,193,947	24,084,582	+ 23,109,365	96.0
Total	82,260,251	64 822,590	+ 17,437,861	26.9
Value	$5,678,937	$4,720.184	+ $958,753	20.3

Again the question arises whether the great increase in lard exports was not, to some extent, due to the oleomargarine law; though lard is a staple whose exports are much affected by speculation and other trade circumstances. In October, however, the lard exports were one-third less than in November, and but 14 per cent. more than last year, and the average monthly exports of lard were a little less than 25 millions per month in the year ending with October last and also the year before.

The total pork product exports in November have been for ten years, in *millions* of pounds:

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
54.7	103.0	98.5	112.0	62.5	42.2	67.3	54.2	64.8	82.3

Thus the exports this year were the largest since 1880, and were exceeded only in 1878, 1879 and 1880. They were also much larger than in any other month of this year, but were exceeded both in January and December of last year. They would not be particularly notable but for the fact that there has been much less packing this year than last since winter.

The total value of cattle, pork and dairy products for November was $7,995,441 this year, against $6,774,061 last year, an increase of 1.8 per cent.; but for the 11 months ending with November the value, excluding live cattle and hogs, was $77,050,048 this year, against $86,118,124 last, a decrease of 9½ per cent.

The total depravity of types was illustrated in our issue of last week by the transformation of the heading to an article which should have read "A Curious *Worn* Rail" into "A Curious *Iron* Rail;" an error repeated in the very first line of the following article. As the brand "Scranton Steel Co." was visible on the side of the rails, and as it need not be said that no iron rails were laid down on the New York elevated lines, or on any other operated line in 1885, the error probably deceived no one, but it is another proof of a familiar experience with proof-readers, that the most likely place of all for errors to escape notice is in a heading.

A correspondent sends in a theory for the cause of the depression, as we expected would be the case, viz.: that "the second worn place was caused by the jump of the wheel out of the first one, just as the first one was caused by the jump at the joint. Probably the second hollow was not worn until the first one was well developed. A hollow once started in a rail increases just as a rut does in a wagon-road, and I have often noticed that one rut in a wagon-road will soon cause another close to it."

The same correspondent offers a choice between this theory and the following: That "the second worn place may have been opposite the joint of the other rail. It is only recently that the road has begun having broken joints, and on curves many of them are nearly opposite, but not quite. The blow at the joint always affects the solid rail opposite it, as I have often observed. It is an error to suppose that only one side of the locomotive or car jumps at the low joint; *both* sides jump, and there is proof positive of this to be seen on any road in the white spot worn in the middle of the solid rail which is *always* and *exactly* opposite the joint on the other side of the track."

We can detect only one fault in this otherwise beautiful theory, that as a matter of fact the rails were laid broken joints, and not "nearly opposite, but not quite," as suggested

A recent test or rather inspection of the signal apparatus of the McLeod Air Signal Co. is reported at length in the Boston papers. The apparatus seems to be the same in substance as that of the "American Pneumatic Signal Co.," described at length with illustrations in our issue of Feb. 13, 1885, but possibly with some modifications, which are not entirely clear from the reporter's descriptions according to which the test seems to have been a very satisfactory one and the apparatus appears to have been doing its work very well.

The main points of the apparatus are that as a train approaches a point where it is desired to give a signal it depresses a lever alongside the rails which actuates a bellows in a little house alongside, which sends a pulse or wave of air to the signal post, where it simply works a trip, which permits a clock-work apparatus to display the desired signal. After being displayed a certain time, or when the locomotive passes the signal post, the signal is withdrawn. The signals may be actuated by independent mechanism if desired, but the same device of a track lever is used in practice both to stop the signal and to wind it up in preparation for the next signal.

A recent test of the Phelps induction telegraph as applied on the first 58 miles of the Lehigh Valley Railroad, between Perth Junction and Easton, is said to have shown very satisfactory results. Messages were sent and received between the moving train and New York city with great ease. It is now reported that nine cars are to be fitted up for use on the road and that the system will be extended as far as Mauch Chunk. It is also reported that the New York, New Haven & Hartford Railroad, where the system has been in use for the past 18 months on the Harlem Branch, has contracted to have the system placed on its main line between New York and Springfield, Mass.

As applied on the Lehigh Valley the system is somewhat different from that used on the line first laid down on the Harlem Branch. An insulated copper wire is laid in the hollow of the rail, passing inside the fish-bars, which on this road stand away from the rail in the middle far enough to leave a clear passage for the wire. Only a single wire is used for both the up and down tracks. Moreover, the car coil is not placed in an iron pipe under the car, as heretofore, but the upper portion is carried on the roof, and the lower portion under the flooring only. These changes are because the inductive current has proved more reliable than was counted on at first, and a greater distance between the two "inducers" is found possible and safe.

A correspondent sends us an inquiry as to the expediency and possibility of using "say an 8-in. pipe, 1,200 ft. long, with 60 ft. fall (uniform), and an exhaust fan at the lower end with thoroughly dried oats or other grain passing in at the upper end," and queries whether this method of handling grain, or a modification by using a forcing blast, would be effectual.

Our correspondent evidently supposes this idea to be a new one. It is, however, in its substance, a very old one. We recall seeing an elaborate model, which worked beautifully, as many as 15 years ago. As a practical substitute for ordinary elevator machinery, however, it does not seem to have made much headway, and we imagine that its possibilities have been pretty well tested.

Receipts by lake and shipments by canal of lumber at Tonawanda (near Buffalo) have been for nine years, in *millions* of feet:

	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Receipts	206.6	256.7	323.4	415.1	433.2	398.9	493.3	498 6	505 4
Shipments	173.1	206,4	291.0	328.9	326.8	354.5	324.5	355.2	347.9

Thus the receipts were larger this year than ever before. These figures do not represent the whole business, as Buffalo has a lumber trade distinct from that at Tonawanda, but the business at that end of the canal is done more and more at Tonawanda. The shipments thence are made by rail largely, the number of cars shipped by the different railroads in each of the last two years having been:

	N. Y. Cen.	Erie.	W. Shore.	Total.
1885	10.207	5,333	1,272	16,812
1886	12,895	5.516	1,000	19,411
Inc. or Dec	+2,688	+ 183	− 272	+2.599
P. c	26.7	3.4	21.5	15.6

This large increase in rail shipments was made in a season when the canal gained largely on other freight, and so is the more notable. But the canal shipments were only a little less than last year, and larger than in any other year except 1883.

Record of New Railroad Construction

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Chicago, Rock Island & Pacific.—This company's *Chicago, Kansas & Nebraska* line is extended west to Sabetha, Kan., 14 miles.

Cincinnati, Jackson & Mackinaw.—Extended from West Alexandria, O., southward to Farmersville, 10 miles.

Fort Worth & Denver City.—Extended from Vernon, Tex., northwest to Chillicothe, 17 miles.

Georgia Midland & Gulf.—Extended northwest to Waverly Hall, Ga., 15 miles.

Kansas City, Wyandotte & Northwestern.—Track laid from Wyandotte, Kan., west 4 miles.

Pittsboro.—Extended westward to Pittsboro, N. C., 3 miles.

St. Joseph & Grand Island.—A branch is completed from Fairfield, Neb., north to Clay Centre, 7 miles.

This is a total of 70 miles on 7 lines, making 6,789 miles reported so far this year. The new track reported to the corresponding date for 15 years has been:

	Miles.		Miles.		Miles.
1886	6.789	1881	7,870	1876	2,278
1885	2,760	1880	6,139	1875	1,333
1884	3,693	1879	3,801	1874	1 844
1883	6,020	1878	2,263	1873	3,630
1882	9,922	1877	2,019	1872	7,160

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

From the Crescent City to the Golden Gate by the Sunset Route. Issued by the Southern Pacific Company.

This is a hand book of the "Sunset Route," or Southern Pacific line from New Orleans to San Francisco. It is very neatly gotten up and profusely illustrated, and contains much information that may be useful to the passenger on the way—and much also that is intended to persuade him to take that route if he intends to go to California.

The publication of these railroad hand-books has grown to be quite an extensive branch of the manifold industries of the Passenger Department on the more important lines. Whether they pay, that department must answer. There has certainly been a very great improvement in them in the last few years, and some of the books are works of art. The Southern Pacific has joined fully in this improvement, and this, its latest issue, is a notable advance upon its earlier one and is entitled to rank among the best of this class of books.

TRADE CATALOGUES.

Gaulard-Gibbs System of Electrical Distribution. Westinghouse Electric Company, Proprietors.

This little pamphlet, except for reprints of one or two notices, consists merely of an abstract of the patent office records giving a description of this ingenious system, which seems to promise so much usefulness, with the arguments as to whether or not its essential features had ever been anticipated. Its fundamental feature, it will be remembered by those who follow such matters, is to dispense with the enormous currents of low "potential" carried by conductors of proportionate size and cost, and which can be carried only short distances, and use instead a current of high potential, which can be carried on a small conductor to almost any distance, reconverting it locally into a current such as is needed for lighting purposes. It illustrates what still unexplored possibilities there are in electric working that it is not even claimed that a single new electrical element or appliance was needed or used to accomplish this plainly most important result. All that was done was to combine in a new way for a new end old and well-known devices, and on this ground patent was refused by the first examiner; a decision, however, which was promptly reversed on appeal. We may add that, to those interested in patent law, as well as in electrical appliances, the pamphlet will have no little interest.

Locomotives Built by the Schenectady Locomotive Works.

The following table presents an interesting resumé showing the changes in the number and size of engines most in use in the last twenty years, so far as it is indicated by the engines built at these works. We hope to be able to present other similar tables for other leading locomotive works.

It will be seen that until the year 1875 there was practically only one kind of engine built at the Schenectady Works, the ordinary 8-wheel American, and only one size of that, 16 × 24 in. cylinders, which was then universally recognized as the standard size. In the year 1875 the 17 × 24 engine first made its appearance among American locomotives, and the ten-wheel first became a prominent class. In 1880 the Moguls came in and in 1885 the Consolidation. The dates and proportionate numbers of these engines will of course vary

greatly at different works, but the general tendency has been the same everywhere.

In 1880 and 1885 the 17 × 24 American outnumbered all others of that class and nearly all others were larger rather than smaller. The same tendency to increase is visible with both the ten-wheel and Mogul type, and with the switching engines.

The increase has been not merely in size of cylinders, but in weights of engines as well; an increase which has amounted to very nearly 20 per cent. in total weight for cylinders of the same size since 1865.

Locomotives built by the Schenectady Locomotive Works in the years named below.

	American.		Ten Wheel.		Mogul.	
	Cylinders.	No.	Cylinders.	No.	Cylinders.	No.
1885.	18 × 24	2	19 × 26	10	19 × 24	6
	18 × 22	12	19 × 24	2	18 × 24	2
	17 × 24	22	18 × 24	34	.....	..
	16 × 24	4	.....	..	.....	..
1880.	18 × 24	34	18 × 24	16	18 × 26	6
	17 × 24	41	.....	.	.....	..
	16 × 24	13	.....	..	.....	..
1875.	17 × 24	6	18 × 24	13	.....	..
	16 × 24	4	.....	..	.....	..
	15 × 24	2	.....	..	.....	..
1870.	16 × 24	43	16 × 24	2	.....	..
	15 × 24	7	.....	..	.....	..
	15 × 22	20	.....	..	.....	..
1865.	16 × 24	39	17 × 24	1	.....	..
	15 × 24	2	.....	..	.....	..
	15 × 22	2	.....	..	.....	..
	11 × 20	1	.....	..	.....	..

	Consolidation.		Switching.		Forney.	
	Cylinders.	No.	Cylinders.	No.	Cylinders.	No.
1885.	20 × 24	5	*18 × 24	4	14 × 18 (Suburban traffic.)	1
	.....	..	*17 × 24	3		..
	.....	..	N. 6, 9 × 14	1		..
	.....	..	.....	..	.....	..
1880.	.....	..	15 × 22	1	.....	..
	.....	..	N. 6, 9 × 14	1	.....	..
	.....	..	.....	..	.....	..
1875.	.....	..	.....	..	.....	..
	.....	..	.....	..	.....	..
	.....	..	.....	..	.....	..
1870.	.....	..	12 × 15	2	.....	..
	.....	..	Dummy	..	.....	..
	.....	..	.....	..	.....	..
1865.	.....	..	14 × 22	1	.....	..
	.....	..	.....	..	.....	..
	.....	..	.....	..	.....	..

First column under each class gives diameter and stroke of cylinders.
Second column under each class gives number of locomotives of that class and size of cylinders.
*18 and 17 in. switching have three pairs of coupled drivers.

Master Car & Locomotive Painters' Association.

The Secretary, Mr. Robert McKeon, has issued the following circular from his office in Kent, O., under date of Dec. 15:

The following programme of questions for consideration at the next convention has been approved by the Advisory Committee, and the President has appointed the committees as named below. Each subject is worthy of a careful study, and time is given for practical experiment and preparation before the meeting in New York. It is therefore expected that all will be prepared to make valuable reports on the questions assigned them.

No. 1. It is generally admitted that scarcely two samples of Japan of different manufacture will give like results as to drying and binding qualities. Why should there be such a variation, and why can we not have a standard of specifications as to drying and binding? In what way shall such a standard for Japan be determined? W. T. Ledford, Richmond & Danville, Richmond, Va.; B. Stanbury, Union Pacific, Omaha, Neb.; Alex. Campbell, Manhattan Elevated, New York.

No. 2. Does the addition of Japan to raw linseed oil retard its drying if used in excessive quantities, and what variation is there in the drying qualities of Japans, when mixed with raw linseed old? M. W. Stines, Barney & Smith Manufacturing Co., Dayton, O.; A. E. Barker, Chicago & Northwestern, Chicago; R. W. Scott, Canadian Pacific, Montreal.

No. 3. What is the maximum of Japan that can be used with safety, and the proportion to raw linseed oil? Jos. J. Murphy, Louisville & Nashville, Louisville, Ky.; H. L. Libby, Charles River Street Railroad, Boston; Wm. E. Hibbard, Boston & Albany, Allston, Mass.

No. 4. What quantity of oil paint, composed of metallic paint, linseed oil and Japan, should constitute a good coat to the square yard of surface? Amount in weight and also measure. F. S. Ball, Pennsylvania, Altoona, Pa.; M. L. Sims, East Tennessee, Virginia & Georgia, Atlanta, Ga.

No. 5. Would it be more economical for the painter to manufacture his own Japan, or continue to use that of the manufacturer? Geo. O. Widner, Lake Shore & Michigan Southern, Buffalo, N. Y.; H. M. Billings, Pittsburgh, Cincinnati, & St. Louis, Columbus, O.

No. 6. Management of the Railway Paint Shop. E. L. Bigelow, Baltimore & Ohio, Baltimore.

No. 7. What constitutes the best priming coat of paint for locomotives and tanks? Jno. S. Atwater, Hinckley Locomotive Works, Boston; F. M. Widner, New York, Lake Erie & Western, Buffalo, N. Y.; C. C. Wood, Geneva, Ithaca & Sayre, Sayre, Pa.

No. 8. What is the best method of mixing and grinding car body colors to insure the greatest durability? Jacob Hoesly, Pennsylvania, Meadow Shops, N. J.; Rob't McKeon, New York, Pennsylvania & Ohio, Kent, O.; John Rattenbury, Chicago, Rock Island & Pacific, Chicago.

No. 9. Causes of iron rusting under the priming coat of paint, and the effect rust has on paint. A. J. Bishop, Cleveland, Columbus, Cincinnati & Indianapolis, Delaware, O.; C. C. Young, Chicago, Rock Island & Pacific, Trenton, Mo.

No. 10. Is it advisable to paint the inside (water space) of an engine tank to protect it, and what material would you consider it best to use? L. W. Smith, Cleveland & Pittsburgh, Wellsville, O.; E. E. Earl, Northern Pacific, St. Paul, Minn.

By resolution passed at the last convention in Chicago, each member is requested to prepare three panels, one each of tuscan red, straw color and olive brown, according to their own formula, expose them to the weather, and report results in writing at the next convention.

On questions No. 1, 2, and 3 a regular committee has been appointed, but the Advisory Committee would recommend that all members make practical experiments, keeping a record of them as made, and report results in writing at the next meeting, and in carrying out the experiments, they would suggest the following tests: Mix raw linseed oil and turpentine Japan, varying the proportion of oil from 2 to 20 parts to 1 part Japan, which would give 19 different mixtures. These should be spread on as many pieces of glass or other non-absorbent surface, and submitted to a temperature of 120 degrees Fahrenheit, noting length of time required for each to dry. The result of these tests would be highly satisfactory, and much definite information obtained, and by having all the members engaged in the test, it would cover nearly all the reputable Japans in the market, and would include many qualities of linseed oil.

Any member unable to serve on the regularly appointed committees should notify the Secretary at an early date, so that their places may be filled.

THE SCRAP HEAP.

Railroad Young Men's Christian Association.

The *Monthly Reporter*, issued by the Association in New York, gives the following notes:

Our custom of serving dinner to railroad and express employees, on Christmas day will be observed this year as usual.

Our anniversary will probably be held on the evening of Jan. 20. Hon. C. M. Depew is expected to deliver one of the addresses.

The foundation and walls of the basement of the new building are now finished. Every pleasant day is taken advantage of by the builder.

Interest in the Bible Study, held Thursday, at 12:15, is still on the increase. The largest number we have ever had at the class came together on the 2d inst., when 36 were present. Those who can come would enjoy it.

An important outcome of our special meetings during the Week of Prayer has been the establishing of a regular weekly meeting for railroad men, held every Tuesday, from 12:15 to 1 o'clock. We have reason to expect that this will become one of the most profitable and successful of our religious meetings.

For the convenience of men living out of town who run into the city during the day and bring their lunch with them, a dining room has been fitted up; it includes a large gas stove, with appurtenances for cooking, such as boilers, coffee pots, dishes, spoons, knives and forks, etc. A cordial invitation is extended to all our members to make use of this room.

The rooms at New Durham are used daily by from 50 or 60 men, while at Weehawken the attendence varies from 30 to 40. Arrangements are being made for a course of lectures and entertainments for our members, which we hope to announce in the near future.

We are indebted to the Chairman of the Branch, Mr. C. Vanderbilt, for a new organ for our Weehawken rooms.

The West Deerfield (Bardwell's Ferry) Accident.

The state of Massachusetts has finally assumed the liability for the accident upon the Troy & Greenfield Railroad at Bardwell's Ferry last spring, as it was obliged to do under its contract with the Fitchburg Railroad Co. Out of the tolls due the state by the railroad company is drawn the sum of $95,879 to reimburse the company for payments made on account of personal injuries received by passengers upon that occasion. This largely reduces the year's income of the state from this property.—*Boston Advertiser.*

He Never Will.

He was a young man who had been talking loudly in the car of his father's riches and his own prospects, when an old woman leaned over the seat and asked:

"Young man, did you say your paw was rich?"

"Yes, ma'am."

"He'll be apt to found some charity, won't he?"

"I think so."

"Settled on anything yet?"

"No, ma'am."

"Then please call his attention to an idiot asylum."—*Wall Street Daily News.*

A Valuable Car-Load.

One day last week a car laden with furs was ferried across the St. Lawrence River at Brockville, transferred to the Rome, Watertown & Ogdensburg Road, and afterward sent through Utica *en route* to New York. The car came from Winnipeg, and the furs it contained were owned by the Hudson Bay Co., and valued at $71,000. The skins in the car represented the destruction of 437 bears, 65 silver foxes, 5,137 beavers, 800 foxes, 4,255 lynxes, 8,178 martens, 291 wolverines, 207 wolves, 65 silver gray foxes, and a host of small animals. Another car-load, valued at over $60,000, passed through to New York a few days ago.—*Utica (N. Y.) Herald.*

An Unusual Freight.

There passed here yesterday by a special freight train over the Southern Pacific Co.'s lines, 10 cars loaded with unusual merchandise. At first sight it appeared limestone rock to rip-rap the river. But closer inspection revealed the fact that it was onyx stone. It aggregated perhaps 200 tons of the rock, and came from above Suisun north of the Sacramento River. Some of the blocks were small, of which it took 100 or more pieces to make the 20 tons placed on each flat car. There was one piece which made a car-load of about 20 tons. A second Titanic chunk made nearly a car-load. It was marked to some person in New York, and after making its long journey from Central California, down the length of half the state, and thence east across the great continent to New York, it is to be shipped to France. There it will be made into many forms of great beauty, mantels, pillars, tables, lamp stands, etc., etc. Much of it will no doubt find its way back to America to ornament some of the palaces being built by the merchant princes of the United States.—*Los Angeles (Cal.) Herald.*

A Runaway Locomotive.

A dispatch from Dayton, Ohio, Dec. 17, says: "An extraordinary case of a runaway locomotive running through this city from its northeastern corner to that of the southeastern occurred to-day. The engine was No. 27, of the Cincinnati, Hamilton & Dayton road. She was in charge of Engineer W. G. Stump and Fireman Frank Currant. They were backing a caboose around a curve just beyond the Mad River when the fireman observed a freight train bearing down on them, coming from the north.

"Stump, perceiving the danger, reversed the lever of his engine and turned on a full head of steam, in hope of starting forward before the locomotive of the freight would strike the caboose. However, he was too late, and seeing that a collision was inevitable, he and the fireman jumped to save themselves. The next moment the engine of the freight, which could not possibly have been stopped, went crashing into the caboose, wrecking it badly and tearing the tender from engine No. 27. During the interval of the engineer and fireman jumping and the collision, the abandoned locomotive commenced moving forward, and in a few minutes was rushing through the city at the rate of from 50 to 60 miles an hour. Numerous streets, five or six of them the leading thoroughfares of the city, were crossed with the rapidity of lightning, and while no one was struck by the wild engine, a number of narrow escapes are reported. A Fifth street car, loaded with passengers, escaped by but a few inches, while pedestrians on foot escaped by as narrow a margin, and never comprehended how close the call was until afterward.

"At Main street the abandoned locomotive jumped the track, and in her wild fury switches were torn up and the rails bent and broken. She ran on the ties and roadbed a distance of several hundred feet, when, in some unaccountable way, she jumped on to the Cleveland, Columbus, Cincinnati & Indianapolis tracks and went flying on through the Union Passenger Depot and on out over the Miami River and out into the country. Three passenger trains had just left the depot a few minutes before the wild engine.

"The locomotive continued on her wild course to near Carrollton, about 10 miles south of here, when she exhtusted herself, and was brought back to Dayton. A train on the road to this city from the south was telegraphed to at Carrollton and side-tracked, and thus a collision was prevented. It is quite remarkable that no one was injured and also that no collision occurred in the 12 or 13 miles that the engine covered, especially when it is considered that fully two miles of the run was through the city."

A Quick-Witted Brakeman.

A dispatch from Elizabeth, N. J., Dec. 17, says: "As the wife of John Colyer, living in a cottage on Trinity Place, was lighting a kerosene lamp last evening, the wrapper which she wore took fire and instantly she was in a blaze. With remarkable presence of mind she refrained from crying out, but tore off the garment and trampled upon it. Her petticoat, however, had also become ignited and she would undoubtedly have been terribly burned but for the arrival of a rescuer. A brakeman on a Pennsylvania freight train, which was passing just back of the house, saw her predicament, leaped from the train and entering the house seized her and smothered the fire. Without waiting for thanks he rushed out and gained the rear end of the train he had left."

Jack Rabbits in Car Loads.

Commissioner Midgley, of the Pacific Coast Association, has issued a circular authorizing a rate of 30 cents per 100 weight to St. Paul, Omaha, Council Bluffs, the four lower Missouri River points, and Chicago from Ontario, Ore., on jack rabbits, in car load lots. The receipt of this circular created considerable sport among the local railroad officials. It is a question if there is a car load lot of jack rabbits in the entire northwest, and the importance of this circular at the present time cannot easily be computed. J. M. Hannaford, of the Northern Pacific road, as soon as he received the circular, ordered the artist of the road to draw a design representing a man in the act of driving a herd of long-eared rabbits into a freight car. This is to be struck off in a three-colored lithograph and sent to Commissioner Midgely to decorate the walls of his office. It is thought that this move will necessitate the appointment of inspectors along the roads for the purpose of preventing any but jack rabbits from getting by them.—*St. Paul (Minn.) Globe.*

Picked Up.

An Iowa railroad conductor who found a pocket-book containing $250 and hunted up the owner, who proved to be an aged granger and his wife, was met with this remark from the old lady: "It was a good thing some one seen you pick it up, or we never would have got it again."—*Indianapolis News.*

In our report of railroad merchandise receipts last week was "one car load of scenery." The general impression is that Colorado has all the scenery needed without importing any.—*Denver Journal of Commerce.*

TECHNICAL.

Locomotive Building.

The Boston & Maine shops in Boston have just completed a heavy eight-wheel engine intended to run fast freight trains between Boston and Portland.

The Rhode Island Locomotive Works in Providence last week delivered a new passenger engine to the Boston & Providence road.

The Taunton Locomotive Works in Taunton, Mass., have nearly finished a locomotive for the Providence, Warren & Bristol road. This locomotive will be something like the Forney type, but will differ from that type in having a four-wheel truck forward, the truck wheels being 26 in. diameter, and the axles 4 ft. 4 in. apart. The forward drivers will have blank or flangeless tires. The cylinders are 17 by 20 in. and the drivers 63 in. diameter. The engine is designed to run over the 27° 20′ curve in Providence, which was described in the *Railroad Gazette* of April 23, 1886, page 277.

The Car Shops.

The Ohio Falls Car Co. re-opened its works in Jeffersonville, Ind., last August, after they had been closed for over a year, and is at present employing 1,000 men in the different departments. It is the intention of the management to further increase the working force as soon as the necessary supplies and materials can be contracted for. The company has now the following contracts on hand: 6 suburban passenger cars for the Wisconsin Central; 5 passenger cars for the East Tennessee, Virginia & Georgia; 4 passenger and 4 baggage cars for the St. Louis & San Francisco; 2 passenger cars for the Nashville, Chattanooga & St. Louis; 2 passenger cars for the Ohio Valley; 4 passenger and 1 baggage car for the Wyandotte, Kansas City & Northwestern; 1 passenger and 1 baggage car for the Cincinnati Northwestern. In freight work, the company has contracts for 300 fruit and 200 box cars for the Louisville & Nashville; 150 box cars for the St. Louis & San Francisco; 300 ore cars for the Wisconsin Central; 150 flat cars for the Lake Shore & Michigan Southern; 60 box and flat cars for the Wyandotte, Kansas City & Northwestern. The company has also made a contract to furnish the Louisville & Nashville with all the wheels required for its passenger cars and locomotive and tender trucks for 1887, and to furnish the Cincinnati, Hamilton & Dayton with all the wheels for its passenger and freight cars for the year. Several Monarch sleeping cars are now being repaired in the shops.

The Boston & Maine shops in Boston have recently completed a baggage car 72 ft. long, to be run on the shore express train in the summer time.

The Latrobe Car Works in Latrobe, Pa., are to be sold on account of the death of one of the members of the firm.

The car shops of Blaine Brothers in Palatka, Fla., are filling a large order for box cars for the Florida Southern, and are building cars for several other roads.

The Washburn Car Wheel Co., in Hartford, Conn., recently shipped 50 steel-tired wheels 28 in. diameter to the Oregon Railway & Navigation Co. and 24 of 30 in. diameter to the Jacksonville, Tampa & Key West road.

Bridge Notes.

The Hopkins Bridge Co. in St. Louis has taken a contract to build a number of combination bridges on the western extension of the San Antonio & Aransas Pass road.

The Passaic Rolling Mill Co. in Paterson, N. J., has contracts for a number of bridges on hand.

W. G. Coolidge & Co. have been awarded the contract for building and sinking the pneumatic caisson, 114 by 20 ft., for

the central pier of the steel arch bridge across the Mississippi River at Minneapolis, Minnesota.

Manufacturing and Business.

The Defiance Paint Works in Cincinnati, O., have recently filled large orders for their mineral creosote paint for railroad companies. It is claimed for this paint that it will stand a very high temperature without burning or blistering, and that it practically renders wood fire-proof against sparks and cinders.

The Carolina Oil & Creosote Co. in Wilmington, N. C., has taken a contract for creosoting bridge timber and ties for the Savannah & Tybee road, now under construction.

The Long & Allstatter Co. in Hamilton, O., has just completed a very large punching machine designed expressly for bridge work. It is arranged to punch channel iron up to 15 in. wide and is also suited to use gangs of tools.

Messrs. Bowler & Co., manufacturers of wheels, frogs, switches and crossings, at Cleveland, O., report that they are full of orders in all departments, having fully twice as much work as a year ago. They write: "We look for two years, at least, of busy times."

Among recent shipments of forges by the Buffalo Forge Co., of Buffalo, N. Y., are: 10 forges for the Studebaker wagon works; 12 forges to Atlanta University, Atlanta, Ga.; 24 forges to Manual Training School, Toledo, O.; 6 additional forges (making 18 in all) to Abbott Buggy Co., Chicago; 6 forges to Groton Carriage Co., Groton, N. Y., besides preliminary shipments to the Pennsylvania State Reform School, and Haverford College, Philadelphia. They are also preparing addition to the original shipment of 12 forges to Cornell University, Ithaca, N. Y. In the ventilating department, they have recently shipped one large 14 ft. fan to the Northern Michigan Insane Asylum, Traverse City, Mich.; one same size to Retsof Mining Co., Pifford, N. Y.; one 12-ft. fan to the Western North Carolina Insane Asylum, Morganton, N. C.; one 4-ft. disk exhaust wheel to the public school department, Brooklyn, N. Y.; one 5-ft. and three 42-in wheels to Syracuse, and one 4-ft. wheel to a large paper mill in San Francisco. The above are independent of routine shipments which show an increase also. The company is preparing a number of new designs in hand and power blacksmith drills to offer the coming year, also a new tool for blacksmiths, adapted to a class of work which is now being done entirely by hand.

Iron and Steel.

The New Albany Steam Forge Co. in New Albany, Ind., is building a new mill 112 by 106 ft. which will contain machinery for making angle bars, plates and car iron.

The Round Mountain Iron & Coal Co. is repairing its furnace at Round Mountain, Ala., and will shortly put it into blast.

The North Chicago Rolling Mill Co. will hold a special meeting Dec. 31 to consider the question of increasing the capital stock from $5,000,000 to $6,000,000.

Park Brothers & Co. are running their Black Diamond Steel Works in Pittsburgh full double turn.

The McCullough Iron Co. at Northeast, Md., has started up its rolling mill, after a stoppage of 5 months.

The Centralia Iron & Nail Co. in Centralia, Ill., has closed a contract for a 2-ton Bessemer steel plant.

Jones & Laughlins are adding to their American Iron Works in Pittsburgh 3 trains of rolls, with the necessary machinery for rolling steel shapes.

The Bethlehem Iron Co. in Bethlehem, Pa., has nearly completed a new building 650 by 113 ft. which will contain machinery for rolling steel shafting and heavy plates.

The Rail Market.

Steel Rails.—The demand continues active and prices are firm at $36 per ton at Eastern mills. The mills have nearly all orders sufficient to keep them busy for the first half of 1887, and are not soliciting orders, and there is talk even of higher prices. There is some demand for light rails, which are quoted at $38@$42, according to sections.

Rail Fastenings.—The market is active and prices are somewhat higher. Spikes are quoted at 2.50 cents per lb. in Pittsburgh; track-bolts at 2.90@3.25 and splice-bars at 1.90 @2.05 cents.

Old Rails.—The market for old iron rails is active, but supply is still short and quotations are $24@$25 per ton at tidewater, with very scant supply.

The Demand for Lumber for Cars.

Lumber for car building purposes is now exciting the chief interest. The demand is urgent and increasing, and yards that have ample stocks of the requisite sizes and grades are doing considerable business in this class of lumber alone. The call is for white pine car roofing, white pine car siding, Norway decking (flooring) and Norway strips for lining. The roofing must be clear and A, and the siding B grade. The roofing requires stuff 5 ft. long, so that 10-ft. strips and 16-ft. strips can be cut into roofing. Short lumber is always priced relatively lower than 16-ft. lumber, but the supply of the short is now so nearly used up, while the demand for it is on the increase, that the tendency is to lift up the price of the short to a level with that of the long. This will bring the long in quicker demand; for sellers, when they find out that the value of short is about equal to that of the long, will cut their 16-ft. lengths into car roofing, making three 5-ft. pieces of each. In that case there will be a waste of a foot that will have to be accounted for in some way. The sides of cars are mostly made of 4-in. B flooring strips, though a crying demand may drop the grade into C. They must be 8 ft. long, so that 16-ft. lengths can be cut in two for this purpose. Decking or flooring requires 2 by 6 Norway. The demand is for 18-ft. lengths, which can be cut in two.

There is a range on car stuff of $2 to $3 a thousand. The buyers for the contractors and factories, of course, want to obtain the stuff at the minimum figure. If a dealer wants the outside price, the buyer offers $2 or $3 less. When the dealer feels solid on values, he lets the buyer travel on; when the dealer is weak, he sells. The buyer sometimes plays sharp, and exhibits a contract for car lumber made last spring, when prices were $3 or $4 less than they now are. The buyers know that the tendency of prices is upward, and are doing all they can to keep them down. The yard dealers are beginning to appreciate the situation, and are insisting on good prices.—*Northwestern Lumberman, Chicago.*

Hydraulic Jacks.

On Dec. 18 Judge Coxe, of the United States Circuit Court, rendered a decision in the action of Richard Dudgeon vs. Thomas H. Watson and Francis H. Stillman for infringement of two patents on improvements in the pumps of hydraulic jacks, by means of which the lowering is more readily and securely effected. The defense was want of novelty and non-infringement. The judge in his opinion describes at length the workings of hydraulic jacks, and says there is no doubt as to the infringement of the patent, as the jack made by defendant works in substantially the same manner as plaintiff's. He decides that plaintiff is entitled to an injunction and an accounting.

24 o'Clock on the Union Pacific.

The following order has been issued by General Superintendent S. T. Smith under date of Dec. 7:

"The '24-hour system' of time has been adopted as standard, and will be put in effect on all divisions with the next issue of the employés' time tables.

"By this system the day begins and ends at midnight, making 24 hours for the day, as under the old system, but with the difference that the hours are numbered consecutively from 1 to 24 instead of 1 to 12 for the hours from midnight to noon, and repeating the numbers to represent the hours from noon to midnight, requiring the addition of the letters a. m. or p. m. to distinguish which hour of the day is meant.

"For the purpose of familiarizing employés with the new system preparatory to putting it in effect, it has been used in printing the condensed time-table for the past two years and all employés having occasion to refer to the time-tables are supposed to be familiar with it.

"The following simple rules will enable any one to readily change the time from one system to the other: To change the time from the old system to the new, add 12 (the number of hours from midnight to noon) to the number of the hour past noon—thus 1 o'clock p. m. would be 13 o'clock under the new system, 2 o'clock p. m. 14 o'clock, and so on.

"To change from the new to the old system the operation is reversed, that is, 12 is deducted from numbers higher than 12 (the hours from midnight to noon numbered 1 to 12 corresponding exactly with the old system) making 13 o'clock equivalent to 1 o'clock p. m., 14 o'clock 2 o'clock p. m., and so on.

"Employés should accustom themselves to thinking of the hours by their new numbers, so that the hours will be as readily suggested by the new numbers as the old, when the necessity for any mental calculation will cease to exist."

Engineers' Club, of St. Louis.

The Club met in St. Louis, Dec. 15, President McMath in the chair and 19 members present. Letter-ballot resulted in the election of the following officers: President, Prof. W. B. Potter; Vice-President, M. L. Holman; Librarian, Prof. J. B. Johnson; Secretary, W. H. Bryan; Treasurer, Chas. W. Melcher; directors, R. E. McMath and Wm. Wise. The Chair appointed J. A. Ockerson and M. L. Holman a committee to escort the newly-elected president to the chair. Professor Potter on taking his seat addressed the members briefly, thanking them for the honor conferred upon him, asking their co-operation in furthering the objects of the Club, and assuring them of his desire and intention to do all in his power to make the year one of interest and profit. He then called upon the retiring President for some remarks appropriate to the occasion. Mr. McMath in responding addressed the Club at some length on the present and future status of the engineer, his connection with national public works, and the prospects of improvement in his condition. The subject of compensation was also touched upon, and the advantages of a closer union among engineering societies were pointed out. The address was received with applause, and the following resolution was introduced and adopted:

"*Resolved*, That this Club appoint a committee of five to consider the subject of a closer connection of existing societies, with a view to forming a general organization."

On motion it was decided that the committee be appointed by the chair. The committee was constituted as follows: R. E. McMath, M. L. Holman, J. A. Seddon, Robt. Moore and Wm. Bouton. The Secretary read a communication from the Secretary of the American Society of Civil Engineers, acknowledging receipt of the Club's letter adopted at the last meeting. The Secretary also read a communication giving the results of the American Society's inquiry into the subject of changes in its organization. But one society—the St. Louis—had expressed an opinion, and only six of the 763 members addressed had replied.

The special order of the day, a paper by Prof. F. E. Nipher, on the "Economic Co-efficient of the Shunt Dynamo," was then taken up. The Professor gave a mathematical discussion of the theory of the efficiency of this class of machine, and showed the conditions under which a maximum was reached. The life and resistance of incandescent lamps was also touched upon. The subject was discussed by Messrs. Flad, Seddon and Bryan. Prof. Nipher also spoke briefly on the subject of discrepancies in measurements of rain-fall in gauges at varying heights. Adjourned.

Canadian Society of Civil Engineers.

At a meeting held in Montreal, Dec. 9, arrangements were completed for organizing the Canadian Society of Civil Engineers. The proposed constitution will be sent out to the members of the profession with a request that each one who gets a copy will join. Ballot papers for the officers will be sent out, after the model of the American Society of Civil Engineers early in January. A provisional committee has been formed with Mr. T. C. Keefer, C. M., Chairman; H. F. Perley, W. P. Anderson, R. Surtees, J. Kennedy, P. A. Peterson, P. W. St. George, Prof. Bovey, Col. Gzowski, Kivas Tully, W. T. Jennings; Alan Macdougall, Secretary.

American Society of Civil Engineers.

At the regular meeting in New York, Dec. 15, the Secretary read a paper by Robert E. McMath on "Determination of the Size of Sewers," in which the author suggested new formulæ and presented a series of four tables giving the discharge of sewers of varying slopes from 1 to 20 ft. diameter, data from St. Louis sewers, a comparative table as deduced from various rules and tables of pipe sewers with hydraulic factors.

The Secretary then read a paper by James B. Francis, Past President of the Society, on "Stoppage of Flow in a Water Main by Anchor Ice." This paper detailed experience with a 12-in. cement-lined water main seven miles long at St. John, New Brunswick.

This paper was discussed at some length by Messrs. Brush, Church and Cooper.

New Suburban Passenger Cars.

The Ohio Falls Car Co. in Jeffersonville, Ind., is now building 6 passenger cars for suburban service on the Wisconsin Central line.

These cars, which are to run in and out of Chicago, are models for the service intended. The interior is finished in oak, a large proportion of English oak being used.

The painting of the ceiling is a work of art, and was designed by Col. Sprague, of the car company. It is made after the style of the old Grecian home, with the light apparently coming through the roof and vines trailing over the glass, through which the light comes. These cars have 14 lamps, 6 of them being side lamps, Wakefield rattan seats, and are heated with Baker heaters. It is the intention of the company to finish all their passenger coaches with English oak.

Ohio Railroad Suggestions.

Railroad Commissioner Apthorp, of Ohio, in his annual report, makes the following recommendations:

"1. The state shall provide the same means of protection to railroad employés from the dangers of unsafe railroad structures that it has to passengers.

"2. The power now held by municipal corporations to compel railroad companies to light street crossings shall be withdrawn.

"3. Whenever at stations railroad companies shall stop enough passenger trains daily for the reasonable accommodation of travelers, they shall not be required to stop other passenger trains.

"4. Railroad companies may consolidate with, or they may lease or purchase the property of, competing railroads."

Commissioner Apthorp gives his arguments in favor of these propositions at considerable length.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Central, of Georgia, annual election, at the Banking House in Savannah, Ga., at 10 a. m. on Jan. 3.

Cincinnati, Hamilton & Dayton, special meeting, at the office in Cincinnati, O., Jan. 5.

Columbus, Hocking Valley & Toledo, annual meeting, at the office in Columbus, O., at 10 a. m. on Jan. 11.

Connecticut River, annual meeting, at the office in Springfield, Mass., at noon on Jan. 19.

Illinois Central, special meeting, at the office in Chicago, at 11 a. m. on Jan. 18.

Lehigh Valley, annual meeting, at the office in Philadelphia, at noon on Jan. 18.

Milwaukee & Northern, special meeting, in Milwaukee, Wis., Jan. 6.

Philadelphia & Reading, annual meeting, at Association Hall, Philadelphia, at noon on Jan. 10.

Providence & Worcester, annual meeting, at the office in Providence, R. I., at 10 a. m. on Feb. 7.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Bell's Gap, 5 per cent., payable Jan. 1, to stockholders of record on Dec. 20.

Chicago, St. Paul, Minneapolis & Omaha, 3 per cent., semi-annual, payable Jan. 20, to stockholders of record on Dec. 31.

Flint & Pere Marquette, 2½ per cent., semi-annual, on the preferred stock, payable Jan. 15, to stockholders of record on Dec. 24. This company paid 2 per cent. last January and 2½ in July.

Milwaukee, Lake Shore & Western, 3½ per cent. on the preferred stock, payable Jan. 15, to stockholders of record on Dec. 28.

Naugatuck, 5 per cent., semi-annual, payable Jan. 3, to stockholders of record on Dec. 9.

Richmond, Fredericksburg & Potomac, 6 per cent., for the year ending Sept. 30 last, payable Jan. 1, to stockholders of record on Dec. 20.

Worcester, Nashua & Rochester, 3 per cent., semi-annual, payable Jan. 10, to stockholders of record on Dec. 25.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

Foreclosure Sales.

The *Shenango & Allegheny* road is advertised to be sold on Jan. 25 next, under decrees of foreclosure of mortgage. The road extends from Greenville, Pa., to Hilliard, 47 miles, with 9.8 miles of short branches. Litigation has been going on for a long time.

Train Dispatchers' Association.

A meeting of the Rocky Mountain District Association was held in Denver, Col., recently, at which resolutions were passed in favor of a new constitution for the general association.

A discussion was had on the merits of the single and double order systems, and on the advisability of a permanent danger signal at all telegraph offices.

New England Railroad Club.

The next regular monthly meeting of this Club will be held at its rooms in the Boston & Albany station, in Boston, on Wednesday, January 12, at 7:30 p. m.

Subject for discussion: *Heating and Lighting Cars in Passenger Service.* In view of the great importance of this question the following interrogations are submitted:

"1. What in your opinion is the most economical, safe and efficient method of heating cars in passenger service? Please describe in full.

"2. Have you ever used steam from the locomotive or otherwise for the purpose of warming your cars? If so, please give results.

"3. Does the method of heating at present in use on your road give entire satisfaction; if so, what is the device in use?

"4. Have you ever used electric lights in your cars; if so with what results?"

The opinion of practical men of experience upon this subject is desired, so that the facts gathered may be utilized by those interested. At this meeting an opportunity will be given any one to demonstrate how it is possible to overcome the difficulties connected with this subject. Those unable to be present are especially requested to communicate their views in writing.

Railroad Commissioners' Conference.

The proposed meeting of railroad commissioners of the northwestern states was held in Des Moines, Ia., Dec. 15 and 16 representatives being present from the commissions of Iowa, Dakota, Colorado, Nebraska, Minnesota, Kansas and Missouri. Mr. Dey, of the Iowa commission, presided. There were also present at the meeting several representatives of the railroad companies, including Pool Commissioner J. W. Midgley; Mr. E. P. Ripley, General Freight Agent of the Chicago, Burlington & Quincy; H. C. Wicker, Chicago & Northwestern; W. M. Sage, Chicago, Rock Island & Pacific; A. L. Bird, Chicago, Milwaukee & St. Paul, and Erastus Young, Union Pacific. Committees were appointed on uniform classification of freight and on interstate commerce. The first day's session was mainly taken up with a general discussion between the Commissioners and the railroad officials regarding various transportation questions. On the second day of the meeting a hearing was given to the railroad representatives. Mr. Ripley spoke briefly on the subject of rates, claiming that they should be based on the cost of the service, the value of the service to the shipper and a reasonable profit on the capital invested. Mr. Midgley spoke at length on the question of pools, presenting arguments in favor of the pooling system.

The Committee on Interstate Commerce presented the following resolutions, which were adopted:

"*Resolved*, That this commission of railroad commissioners of the states of Iowa, Kansas, Missouri, Nebraska, Colorado

and Minnesota, and the territory of Dakota, while regretting the differences which have occurred between the true friends of interstate regulations leading to the failure of the Cullom bill act, we rejoice to learn that the conference committee of the Senate and House of Representatives of the Congress of the United States have agreed upon a measure retaining the essential features of the Cullom bill.

"That it is the sense of this convention that the state railway commissioners will not attain to the full measure of their usefulness till they are supplemented by a national commission having control of interstate commerce; and

"That we regard any regulation of rates based upon a prorated scale of mileage as detrimental to the interests of the respective states and territories."

Commissioner Coffin, of Iowa, offered a resolution suggesting that the interstate commerce bill should have some provision by which the short haul clauses and the prohibition of pooling may be suspended in their action, provided they should prove on trial disastrous to railroad or other interests. This resolution called out a sharp debate, and it was finally withdrawn.

The Committee on Uniform Classification reported in favor of the reference of the subject to a permanent committee, to report at the next meeting. This was adopted.

The Committee on Plans, for requiring uniform reports from companies, recommended that action be deferred for the present.

Resolutions were adopted in favor of an adjourned meeting, to be called in April or May next, such meeting to be resolved into a conference with the National Railroad Commission, should the interstate commerce bill be passed, and the meeting then adjourned.

ELECTIONS AND APPOINTMENTS.

Chicago, Burlington & Kansas City.—Mr. Howard Elliott has been appointed General Freight and Passenger Agent, in place of J. H. Best, Jr., resigned.

Chicago, Burlington & Northern.—Mr. J. M. Horne has been appointed Division Superintendent in place of David Coleman, deceased.

Chicago, Burlington & Quincy.—A number of changes, it is reported, will take place Jan. 1. Mr. W. C. Brown will be Superintendent of the Iowa lines in place of Mr. W. F. Merrill, transferred to the Hannibal & St. Joseph. Mr. L. E. Johnson will succeed Mr. Brown as Superintendent of the St. Louis Division. Mr. Alexander Forsyth will take Mr. Johnson's place as Master Mechanic of the Chicago Division, and Mr. Philip Wallis, now in the Aurora shops, will succeed Mr. Forsyth as Master Mechanic of the St. Louis Division.

Charlotte, Columbia & Augusta.—At the annual meeting in Columbia, S. C., Dec. 2, the following directors were elected: James H. Rion, A. C. Haskell, A. B. Davidson, S. B. Alexander, F. W. McMaster, Charles Estes, Josiah Sibley, R. Y. McAden, John C. Haskell, Eli B. Spring, J. O. Matherson, W. P. Clyde, W. B. Stanley, G. S. Scott, F. W. Huidekoper, J. J. McClure; A. S. Bufort, Mayor of Augusta, *ex-officio* member of the board. Officers were elected as follows: A. C. Haskell, President; John Craig, Secretary; John C. B. Smith, Treasurer.

Chicago, Santa Fe & California.—This company having bought the Chicago & St. Louis road, that line will hereafter be known as the Chicago Division. President Norman Williams has appointed the following officers for that division: F. E. Hinckley, General Manager; A. H. Crocker, Superintendent, with headquarters at Streator; J. B. Maloney, General Freight Agent; B. T. Lewis, General Ticket Agent; A. M. Hinckley, Auditor. The general office will be established at Chicago.

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. J. F. Ewing has been appointed Division Freight Agent of the C., C., C. & I. R'y, Cincinnati, O., vice Mr. Fred Raine, resigned, to enter into other service. Mr. Walter R. Hill has been appointed General Agent at Louisville, Ky., to succeed Mr. J. F. Ewing, transferred. Appointments to take effect Jan. 1, 1887.

Columbia & Greenville.—At the annual meeting in Columbia, S. C., Dec. 2, the following directors were elected: C. H. Suber, John L. Young, John C. Haskell, H. Beattie, R. L. McCaughrin, Joseph Walker, James H. Rion, George S. Scott, F. W. Huidekoper, John Ferguson, W. P. Clyde, E. Murray. The following officers were re-elected: A. C. Haskell, President; John C. B. Smith, Treasurer; John Craig, Secretary.

Denton & Northwestern.—The incorporators are: T. W. Aney, Alvin C. Owsley, J. A. Robinson and Isaac B. Walker, all of Denton, Texas.

Engineers' Club of St. Louis.—The officers elected for the ensuing year are: President, Prof. W. B. Potter; Vice-President, M. L. Holman; Librarian, Prof. J. B. Johnson; Secretary, Wm. H. Bryan; Treasurer, Charles W. Melcher; directors, Robt. E. McMath, Wm. Wise.

Griffin, Laqrange & Western.—This company has been organized with the following officers: President, W. E. H. Searcy; Vice-President, J. W. Sullivan; Secretary, T. D. Rockwell; Treasurer, J. G. Truitt. Office at Griffin, Georgia.

Hartford & Connecticut Valley.—At the annual meeting in Hartford, Conn., Dec. 14, the following directors were chosen: Samuel Babcock, Wm. D. Bishop, Charles M. Pond, E. M. Reed, Henry C. Robinson, Daniel C. Spencer, E. H. Trowbridge, George H. Watrous, Nathaniel Wheeler. The board elected George H. Watrous, President; Samuel Babcock, Vice-President; Wm. C. Brainard, Secretary and Treasurer.

Hartford & Connecticut Western.—At the annual meeting in Hartford, Conn., Dec. 21, the following directors were chosen: Thomas Cornell, William L. Gilbert, C. T. Hillyer, Frederick Miles, Samuel G. Dimmock, A. H. Holley, George S. Frink, Wm. H. Barnum, Henry Gay, Lyman Dunning, Milo B. Richardson, J. O. Phelps, Henry A. Botsford. Messrs. Botsford and Frink are new directors, replacing Milo Hunt and L. B. Merriam.

Housatonic.—At the annual meeting in Bridgeport, Conn., Dec. 17, the following directors were chosen: Wm. H. Barnum, Lime Rock, Conn.; A. B. Mygatt, New Milford, Conn.; Wm. D. Bishop, Horace Nichols, Bridgeport, Conn.; Wm. E. Downes, D. W. Plumb, Birmingham, Conn.; H. G. Leavitt, Henry Hentz, Francis A. White, New York. Messrs. Hentz and White are new directors, replacing C. K. Averill and John B. Peck. It is understood that the new directors represent an interest in the road recently acquired by Mr. J. A. Bostwick, the new President of the New York & New England.

Housatonic Valley.—The incorporators are: J. D. Bewell, C. S. Bushnell, Gen. S. E. Merwin, F. S. Andrews, H. P. Frost, New Haven, Conn.; E. V. Shelton, M. E. Downs, Thomas Wallace and T. L. Cornell, Birmingham, Connecticut.

Indiana, Illinois & Iowa.—Mr. John H. Palmer has been appointed General Freight and Passenger Agent, with office at Kankakee, Ill. He was formerly on the Central Massachusetts road. Mr. D. L. Murphy has been appointed Superintendent.

Iron Range Northern.—The incorporators are: J. P. Beck, Charlemagne Tower, Jr., W. P. Dixon, R. H. Lee, H. F. Thompson, A. H. Viele, Duluth, Minn.; George C. Stone, St. Paul, Minn.; S. P. Ely, Cleveland, O.; Charlemagne Tower, Philadelphia.

Kansas & Gulf Short Line.—Mr. T. W. Clawson is now General Superintendent. The offices of Master of Transportation, Master Mechanic and Roadmaster have been abolished.

Kansas, Nebraska & Minnesota.—The directors of this new company are: A. Bennett, A. J. Hersington, H. P. Myton, W. S. Smith, Garden City, Kan.; Porter D. Terry, Strong City, Kan.; J. N. Beatty, Catlin, Col.; A. B. Boylan, S. H. Carr, C. O. Chapman, A. J. Deverre, W. H. Lynn, B. H. O'Connor, B. C. Purcells, E. P. Williams, Lakin, Kansas.

Lehigh Valley.—The following from General Traffic Manager John Taylor, of this road, the Pennsylvania & New York, the Geneva, Ithaca & Sayre, and the Southern Central Railroad, is dated Mauch Chunk, Pa., Dec. 4: "The office of General Traffic Manager of these companies has this day been removed to the Anthracite Building, South Bethlehem, Pa Post-office address, Bethlehem, Pa. All communications should be addressed as above."

Louisville & Nashville.—Mr. C. H. Trimble has been appointed Traveling Freight Agent, with headquarters at Louisville, Ky., vice Mr. H. G. Barclay, who has been made General Agent at Mobile, Ala. Mr. John Fitzgerald has been appointed Traveling Freight Agent, with headquarters at Memphis, Tenn., vice C. H. Trimble, transferred.

Mobile & Northwestern.—The United States Circuit Court at Oxford, Miss., has appointed Mr. Benjamin Wilson, of Memphis, Tenn., Receiver of the road.

Montana Union.—N. J. T. Dana, President and General Manager, announces that he has assumed control of the affairs of the Montana Union Railway, with office at Butte, Mont. Existing orders and routine will remain in force and be observed for the present.

New York City & Northern.—Mr. Ellis B. Edwards has been appointed General Superintendent in place of Mr. Frank S. Gannon, who has gone to the Baltimore & Ohio.

New York, Lake Erie & Western.—Mr. Leslie P. Farmer has been appointed General Passenger Agent, in place of Mr. J. N. Abbott, resigned. Mr. Farmer was at one time General Passenger Agent of the Pennsylvania Railroad, but resigned that position on account of ill health. He was subsequently appointed New England Agent of the Pennsylvania Railroad, and now holds that position.

New York & New England.—At a meeting held Dec. 21 the directors elected the following Executive and Finance Committee: W. H. Starbuck, Thomas W. Pearsall, A. E. Bateman, Jonas H. French, Elijah Smith, John L. Macauley, Heman Clark.

Mr. William P. Shinn has been chosen Vice-President of this company. Mr. Shinn has an extended railroad experience, having been connected with the Allegheny Valley Railroad, and subsequently with the Pittsburgh, Ft. Wayne & Chicago, on which roads he served as Engineer, General Freight Agent, Auditor and General Superintendent. He is also well known as a student of, and a writer on railroad questions. Mr. Shinn at present resides in New York.

Mr. Shinn will act as General Manager for the present, but it is stated that Mr. Wm. A. Stevenson will be appointed to that position. Mr. Stevenson is now Superintendent of the New York Division of the New York, New Haven & Hartford road.

Pensacola & Atlantic.—This company, which is controlled by the Louisville & Nashville, has re-elected Milton H. Smith President; W. D. Chipley, Vice-President; R. K. Warren, Secretary; W. W. Thompson, Treasurer.

Pittsburgh, Cincinnati & St. Louis.—Mr. W. H. Scriven is appointed Engineer of Maintenance of Way of the Little Miami Division in place of Mr. C. M. Cook, who has been granted leave of absence on account of continued ill health.

Richmond & Danville.—At the adjourned annual meeting in Richmond, Va., Dec. 16, the following were elected: President, Alfred Sully, New York. Directors, E. D. Christian, J. H. Dooley, Thomas M. Logan, James B. Pace, Richmond, Va.; R. K. Dow, Claremont, N. H.; H. M. Flagler, John H. Inman, Emanuel Lehman, John G. Moore, Isaac G. Rice, J. A. Rutherford, George F. Stone, New York.

St. Louis, Keokuk & Northwestern.—Mr. Howard Elliott has been appointed General Freight and Passenger Agent, in place of Mr. J. H. Best, Jr., resigned.

Train Dispatchers' Association.—The officers of the Rocky Mountain District Association are: President, John B. McCormick, Denver, Col.; Vice-President, C. A. McMaster, Denver, Col.; Secretary and Treasurer, J. N. Galbraith, Denver, Col. The Executive Committee is as follows: T. J. Reese, McCook, Col.; T. J. Gwinn, Gunnison, Col.; J. W. Henderson, Pueblo, Col.; A. F. Vick Roy, Denver, Col.; R. W. Baxter, Laramie, Wyoming.

Texas & Pacific.—The following order from the Receivers announces a change heretofore noted; it is dated Dallas, Tex., Dec. 8: "Jacob Johann is hereby appointed Superintendent of Motive Power and Rolling Stock for the Receivers of this road, with headquarters at Marshall, Tex., to fill the vacancy occasioned by the resignation of Mr. F. Mertsheimer. Division Master Mechanics will report direct to Mr. Johann. Appointment to take effect Dec. 9, 1886."

Texas, Santa Fe & Northern.—At a meeting held in Santa Fe., N. M., last week, the following directors were chosen: L. M. Meily, Lima, O.; L. M. Schwan, Grant B. Schly, F. G. Nelson, New York; B. Seligman, John Symington, Thomas Smith, Santa Fe. The new directors elected the following named officers: President, L. M. Meily; Vice-President, B. Seligman; Secretary, John Symington; Assistant Secretary and Treasurer, L. M. Schwan.

Virginia Midland.—At the annual meeting in Alexandria, Va., Dec. 15, the stockholders elected Gen. T. M. Logan President, and the following directors for the ensuing year: John S. Barbour, C. M. Blackford, J. T. Lovell, J. C. Maben, Jno. A. Rutherford, Geo. Parsons, Isaac L. Rice, Alfred Sully, Robert K. Dow, Geo. F. Stone, James B. Pace, Emanuel Lehman, C. G. Holland, Jno. H. Inman, W. H. Payne and E. D. Christian.

Wabash, St. Louis & Pacific.—Judge Gresham, in the United States Circuit Court, has appointed Judge Thomas M. Cooley, of Ann Arbor, Mich., Receiver of this company's lines in Indiana and Illinois. The appointment has been extended to the lines in Ohio by the United States Court for that circuit.

Washington & St. Mary's.—At the annual meeting in Baltimore, Dec. 21, the following directors were chosen: Wm. P. Henzey, John F. Betz, E. P. Graham, B. F. Fisher, E. I. Matthews, Wm. H. Wile, John M. Brown, Baltimore; Andrew Albright, Newark, N. J.; Thomas Cochran, Philadelphia.

Worcester, Nashua & Rochester.—At the annual meeting in Worcester, Mass., Dec. 21, the following directors were elected: Charles A. Sinclair, John A. Spaulding, E. B. Stodard, George C. Lord, Frank Jones, James P. Cook, Frank A. McKean, George W. Armstrong, Charles Holman. At a subsequent meeting of the directors, Charles A. Sinclair was re-elected President and T. W. Hammond Treasurer and Clerk.

PERSONAL.

—Mr. Charles Conners, Master Mechanic of the New Orleans & Northeastern road, died in New Orleans, Dec. 4, aged 55 years.

—Col. A. S. Buford, for many years connected with the Richmond & Danville Co., retired from his position as President at the annual meeting last week.

—Mr. J. H. Best, Jr., has resigned his position as General Freight and Passenger Agent of the Chicago, Burlington & Kansas City and the St. Louis, Keckuk & Northwestern roads.

—Mr. C. M. Cook, Engineer of Maintenance of Way of the Little Miami Division, Pittsburgh, Cincinnati & St. Louis, has been granted leave of absence on account of continued ill health.

—Mr. William H. Stevenson, who was chosen one of the new directors of the New York & New England Railroad Co. last week, has been for five years past Superintendent of the New York Division of the New York, New Haven & Hartford Road, and for ten years previously was Superintendent of the Shore Line Division of that road. It is now reported that Mr. Stevenson is to be General Manager of the New York & New England Road.

— At the annual meeting of the Virginia Midland Co., Dec. 15, the following resolutions were passed on the retirement of Mr. F. W. Huidekoper from the presidency:

"*Resolved*, That the thanks of the stockholders of the Virginia Midland Railway Co. are cordially tendered to President Huidekoper for the skill, energy and success with which he has managed and developed the property, and for the condition in which he leaves it, and for the prosperity which his management predicts for the future."

—Col. A. B. Andrews has been elected Third Vice-Presiden of the Richmond & Danville Co. Col. Andrews was at one time Superintendent of the Raleigh & Gaston and subsequently of the North Carolina Railroad. For some time past he has been Vice-President and General Superintendent of the Western North Carolina road, and had charge of that road during the period of its extension. Since the lease of the Western North Carolina to the Richmond & Danville he has continued in charge of the road as Division Superintendent.

—Col. Green J. Foreacre died somewhat suddenly in Newark, O., Dec. 16, aged 58 years. Col. Foreacre was born in Ohio, but went South at an early age, and began railroad work in 1850 on the old Macon & Western road as a freight conductor, serving subsequently as roadmaster. He left that road to take a position as Roadmaster on the New Orleans, Jackson & Great Northern, which he retained until 1861. He served during the war in the Seventh Georgia Regiment, and after the war was appointed General Agent of the Central Railroad of Georgia. In 1870 he was made Superintendent of the Western Railroad of Alabama, and in 1873 he returned to the road where he first began as Superintendent. He left that line in 1875 to become General Manager of the Virginia Midland, but remained there for two years only, when he accepted a position as General Manager of the Atlanta & Charlotte Air Line. In 1883 he was made Superintendent of the Georgia Pacific, but retained that office only about a year, having been appointed, early in 1884, General Manager of the Trans-Ohio Division of the Baltimore & Ohio Railroad, which position he has since held.

—Mr. Benjamin Hyde Edgerton, one of the oldest civil engineers in the Northwest, died at Chicago, Dec. 9, aged 75 years. Mr. Edgerton was born near Norwich, Conn., in April, 1811; with his parents he removed to Taberg, near Rome, N. Y., at an early age. After some experience with a merchant in Rome, he was employed in 1835 on government surveys at Green Bay, then in Wisconsin Territory; after serving a time in the territorial Legislature he was attracted towards the newly settled Milwaukee, and journeyed thither on horseback. He became the first City Engineer of that place and, with Joshua Hathaway, surveyed what is the oldest part of the present populous city of Milwaukee. In 1849-50 he was employed in locating the railroad line from Milwaukee to Waukesha; this was a part of the Milwaukee & Prarie du Chien, and Mr. Edgerton was made Chief Engineer and later Superintendent until the road was absorbed in the Chicago, Milwaukee & St. Paul system. After this Mr. Edgerton was Engineer-in-chief of the following roads: La Crosse, Trempealeau & Prescott; Milwaukee & Fond du Lac; Kansas City & Santa Fe, and the Milwaukee & Northern. Mr. Edgerton then retired, owing to ill-health, and in 1878 settled in Chicago, Ill., where he died.

TRAFFIC AND EARNINGS.

Ohio River Pool.

The Executive Committee at Chicago, Dec. 15, considered the subject of percentages for the division of traffic as between the Cincinnati and Louisville outlets on Southern traffic, and those *via* Cairo and Evansville; but no agreement being reached, the matter was laid over until the next meeting of the committee, to be held Dec. 28. It was agreed that the present pool should be continued until Jan. 15, 1887.

The general freight agents of the roads members of this association met on Dec. 14 and 15, but transacted no business of special importance.

Advance in East-Bound Rates.

Commissioner Fink announces that east-bound rates will b advanced on Dec. 27 to the following basis: Chicago to New York, on 9th class, 35 cents per 100 lbs.; on 10th class, 30 cents. This is 5 cents per 100 lbs. higher than the present tariff. The advance made Dec. 20 was on the 11th and 12th classes.

The Objectionable Bill of Lading.

At meeting of the freight agents of the Chicago east-bound roads on Dec. 16, the Michigan Central, the Wabash and the Chicago & Grand Trunk representatives gave notice that they would not use the new bill of lading adopted by the Middle & Western States Freight Association, to take effect Jan. 1, 1887. Shippers at Chicago and other Western points have protested strongly against the loss and damage clause in the bill, and it will probably be amended.

Cotton Pool Meeting.

A meeting was held in Louisville, Ky., Dec. 22, for the purpose of forming a cotton pool of the roads south of the Ohio, in connection with that already existing north of the Ohio. Nothing but preliminary business was transacted.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c
Eleven months to Nov. 30:				
Ala. Gt. South...	$1,085,622	$960,486	I. $125,136	13.0
California South.	648,283	... ..	....	...
Cape F. & Y. V...	205,883	188,103	I. 17,780	9.5
C., Jack. & Mack.	165,432	118,202	I. 47,230	39.8
Cin., N. O. & T. P.	2,589,500	2,419,834	I. 169,666	7.1
Den. & R. G.....	952,800	946,851	I. 5,949	0.6
Des. M. & Ft. D..	304,073	347,420	D. 43,347	12.6
Hous. & Tex. C..	2,706,792	2,391,855	I. 314,937	13.2
Nash., C. & St. L.	2,170,825	1,941,200	I. 229,625	11.8
Net earnings....	873,474	785,326	I. 88,148	11.2
N. Orl. & N. E	578,608	615,466	D. 36,858	5.9
Northern Central.	5,016,808	4,983,223	I. 33,585	0.7
Net earnings....	1,768,945	2,014,054	D. 245,109	12.1
Pennsylvania.....	45,950,856	41,568,347	I. 4,382,509	10.5
Net earnings...	16,361,303	14,776,070	I. 1,585,233	10.7
Rich. & Danville:				
Rich. & D. Div..	3,720,040	3,623,498	I. 96,542	2.7
Va. Mid. Div....	1,428,922	1,432,472	D. 3,550	0.3
West. N. C. Div.	488,621	437,076	I. 51,545	11.8
South Car. Div..	712,031	734,557	D. 22,526	3.1
Gr. & Col. Div..	545,461	620,919	D. 75,458	12.2
South Carolina...	1,022,638	1,029,331	D. 6,693	0.6
Vicks. & Mer.....	456,888	412,127	I. 44,761	10.8
Vick., S. & P	445,662	378,654	I. 67,008	17.7
Ten months to Oct. 31:				
Bur., C. R. & No.	$2,315,860	$2,513,599	D. $177,739	7.1
Net earnings..	605,923	765,763	D. 159,840	20.8
Hous. & Tex. C...	2,319,269	2,000,231	I. 319,038	15.9
Net earnings..	476,104	425,319	I. 50,785	11.9
Rome, W. & Og..	2,207,116	1,419,376	I. 787,740	55.6
Net earnings..	959,740	497,288	I. 462,452	92.8
Southern Pac. Co.:				
Atlantic System	6,889,535	7,223,274	D. 333,739	4.6
Net earnings..	1,575,419	2,916,925	D. 1,341,506	46.0
Pacific System..	19,242,555	17,915,610	I. 1,326,945	7.4
Net earnings.	9,621,321	9,693,553	D. 72,232	0.7
Nine months to Sept 30:				
Central Pacific...	$11,798,251	$10,817,344	I. $980,907	9.1
Net earnings..	6,464,311	6,106,374	I. 357,937	5.9
Month of September:				
Central Pacific...	$1,555,411	$1,482,205	I. $73,206	4.9
Net earnings...	864,276	936,223	D. 71,947	7.7
Cleve. & Mar.....	24,633	28,450	D. 3,817	13.9
Month of October:				
Bur., C. R. & No.	$316,204	$349,503	D. $33,299	9.5
Net earnings..	119,906	159,537	D. 39,631	24.8
Houston & T. C..	386,460	461,538	D. 75,078	16.2
Net earnings ..	169,422	263,670	D. 94,248	35.7
Rome, Wat. & Og.	299,866	182,244	I. 117,622	68.6
Net earnings..	160,131	85,215	I. 74,916	88.1
So. Pacific Co.:				
Atlantic System	775,106	931,184	D. 156,078	16.8
Net earnings.	174,382	481,821	D. 307,459	64.8
Pacific System..	2,116,230	2,113,219	I. 3,011	0.1
Net earnings.	1,054,176	1,266,336	D. 212,160	16.7
Month of November:				
Ala. Gt. South...	$130,828	$98,636	I. $32,192	32.5
California South.	82,114	.....	.....	...
Cape F. & Y. Vy.	21,407	16,769	I. 4,638	27.6
Cin., J. & Mack..	16,009	12,019	I. 3,990	33.2
Cin., N. O. & T. P.	269,767	252,673	I. 17,094	6.8
Den. & R. G. W..	92,850	98,564	D. 5,714	5.8
Des. M. & Ft. D..	29,377	38,305	D. 9,028	23.6
Fla. Ry. & N. Co	93,152	108,214	D. 15,062	13.9
Houston & T. C..	387,523	391,624	D. 4,101	1.0
Nash., C. & St. L.	213,768	181,488	I. 32,280	17.8
Net earnings...	91,272	74,194	I. 17,078	23.0
N. Orl. & N. E	82,001	76,063	I. 5,938	7.8
Northern Cen.....	493,150	483,594	I. 9,556	1.9
Net earnings. ..	197,926	207,928	D. 10,002	4.8
Pennsylvania	4,347,219	3,971,540	I. 375,769	9.4
Net earnings...	1,526,721	1,616,285	D. 89,564	5.5
Rich. & Danville:				
R. & D. Div....	412,514	365,998	I. 46,516	12.7
Va. Mid. Div....	136,243	132,291	I. 3,952	2.9
Wa. & O. Div....	10,305	9,318	I. 987	1.1
West. N. C. Div.	43,903	43,059	I. 844	1.9
South Car. Div.	85,603	77,735	I. 7,868	10.1
Gr. & Col. Div.	63,318	78,023	D. 14,705	18.8
South Carolina...	113,699	113,119	I. 490	0.4
Vicks. & Mer....	59 384	64,840	D. 5 456	8.4
Vick., Shre. & P.	65,499	61,058	I. 4,441	7.3
Second week in December:				
Buff., R. & Pitts.	$30.073	$27,855	I. $2,218	7.9
Cairo, V. & C.....	13,883	10 450	I. 3,433	32.7
Chi. & East. Ill..	40.769	39,234	I. 1,535	3.9
C., I., St. L. & C..	53,681	47,960	I. 5,721	11.9
Illinois Central...	295,900	300,654	D. 4.754	1.5
Iowa lines.... ..	42,400	4 ,080	I. 2,320	5.8
Mil. & Northern..	14,076	9,057	I. 5,019	55.7

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Anthracite Coal Tonnage.

Anthracite coal tonnage for November and the eleven months to Nov. 30 is reported as follows by Mr. John H. Jones, the Official Accountant, the statement including the entire production of anthracite coal, excepting that consumed by employés and for steam and heating purposes about the mines:

	November.		Eleven months.	
	1886.	1885.	1886.	1885.
Phila. & Reading... ...	1,246,876	1,174,452	10,987,453	10,545,064
Lehigh Valley	627,333	660,545	5,587,537	5,478 388
Del., Lack. & West... .	529.109	528.238	4,694,380	4,598.890
Del. & Hud. Canal Co...	349,844	384,867	3,216,854	2,983,659
Pennsylvania Railroad..	312,204	308 934	3,190,325	3,092,338
Pennsylvania Coal Co..	146,528	159,086	1,227,204	1,355,044
N. Y., L. E. & W..... ..	65,743	62,964	661,250	573,322
Total.....	3,277,637	3,279,116	29,325,012	28,626,705

The decrease for the month was 1,479 tons, all the changes being small; increase for the year, 698,307 tons, or 2.6 per cent., all the companies showing gains except the Pennsylvania Coal Co.

The division of the tonnage for the eleven months was as follows, comparisons being made with 1885, 1884 and 1883:

	1886.	1885.	1884.	1883.
Philadelphia & Reading...	36.4	36.8	36.6	38.7
Lehigh Valley	19.0	19.2	19.4	19.7
Del., Lack. & Western	16 0	16.1	16 8	15.9
Del & Hudson Canal Co.... ...	11.0	10 4	10.9	11.1
Pennsylvania Railroad	10.9	10.8	10.4	8 6
Pennsylvania Coal Co.	4.4	4.7	4.5	4.8
N. Y., Lake Erie & Western. ...	2.3	2.0	1.4	1.2
Total.....	100.0	100.0	100.0	100.0

The stock of coal on hand at tidewater shipping points, Nov. 31, 1886, was 393,202 tons; on Oct. 31, 440,962 tons; decrease, 47,760 tons, or 10.8 per cent. On Nov. 30, 1885, the stock at tidewater points was 670,403 tons.

Protest against Advance in East-bound Rates.

The Transportation Committee of the St. Louis Merchants' Exchange made the following protest against the advance in east-bound rates last Monday:

"*Albert Fink, Commissioner, New York; George R. Blanchard, Commissioner, Chicago; and the Presidents of the Trunk Lines:* The advance to take effect Dec. 20 is inimical to the country's commerce. Railroad earnings for eleven months this year exceed those of last by about $22,000,000. Does the increased prosperity necessitate the advance? The advance must necessarily force wheat into elevators and corn into cribs and keep them there until navigation opens, when the railroads must divide the business with water craft and carry their share at rates much lower than those now in effect. The advance will divert a large portion of the tonnage that does move to outside lines and cause, more or less, irregularity and demoralization. We ask you to further consider these features and then decide if a steady movement at present rates will not be more profitable to your interest than a limited volume of business at the advanced rates, followed by reduced rates on your share of the winter's business held over. Please answer if you are opposed to the advance being made.

D. R. FRANCIS,
"Chairman Transportation Committee."

Coal.

Coal tonnages for the week ending Dec. 11 are reported as follows:

	1886.	1885.	Inc. or Dec.	P.c.
Anthracite	642,370	723,087	D. 80,717	11.2
Eastern bituminous.	262,395	264,656	D. 2,261	0.9
Coke	84,893	66,078	I. 18,815	28.5

The anthracite market is reported in good condition, with prices kept up to the companies' lists much more closely than is usual.

The combination to regulate the seaboard bituminous trade is progressing toward completion. At a recent meeting of the Committee it was agreed by all parties to submit the points still in dispute to arbitration.

Pennsylvania Railroad coal tonnage for the week ending Dec. 11, was:

	Coal.	Coke.	Total.	1885.
Line of road	153,266	81,342	234,608	241,837
From other lines..	71,197	3,551	74,748	104,504
Total..... ..	224,463	84,893	309,356	346,341
Year to Dec. 11....	10,924,007	3,371,480	14,295,487	13,351,295

Decrease for the week, 36,985 tons, or 10.7 per cent.; increase for the year, 944,192 tons, or 7.1 per cent.

Cumberland coal shipments for the week ending Dec. 18 were 55,079 tons. Total to Dec. 18 this year, 2,446,765; last year, 2,715,444; decrease, 268,679 tons, or 9.9 per cent.

Pennsylvania Railroad coal tonnage for the week ending Dec. 18 was:

	Coal.	Coke.	Total.	1885.
Line of road.....	157,458	76,133	233,591	243,789
From other lines..	69,672	1,370	71,042	108,559
Total...	227,130	77,503	304 633	352,348
Year to Dec. 18....	11,151,137	3,448,984	14,600,121	13,703,643

Decrease for the week, 47,715 tons, or 13.6 per cent.; increase for the year, 896,478 tons, or 6.5 per cent.

Cotton.

Cotton movement for the week ending Dec. 17 is reported as follows, in bales:

Interior markets:	1886.	1885.	Inc. or Dec.	P.c.
Receipts.....	168,234	179,833	D. 11,590	6 4
Shipments..... ...	159 366	132,937	I. 26 429	19.9
Stock, Dec. 17.....	410,953	481,239	D. 70,286	14.6
Seaports:				
Receipts..... ..	260.659	238,011	I. 22,648	9.5
Exports	198,910	133,566	I. 65,344	48.6
Stock, Dec. 17.....	1,043,302	1,019,448	I. 23,854	2.3

The total movement from plantations for the crop year to Dec. 17 is estimated at 4,025,394 bales, against 4,049,750 last year, 3,982,054 in 1884 and 3,937,337 in 1883.

Chicago Shipments Eastward.

The Board of Trade reports east-bound shipments from Chicago for the week ending Dec. 18 as follows, in tons:

	Tons.	P. c.		Tons.	P.c.
Chi. & Gd. Trunk...	10,344	21.5	Pitts., Ft. W. & C...	6,210	12.9
Mich Central...	5,369	11.2	Chi., St. L. & Pitts..	6,855	14.3
Lake Shore	6,274	13.0	Balt. & Ohio..... ..	4,490	9.3
N. Y., Chi. & St. L..	5,958	12.4	C., Ind., St. L. & C..	2,500	5.4

The statement includes local as well as through shipments. The total for the week was 48,080 tons, being an increase of 2,842 tons, or 6.3 per cent., over the previous week. The shipments were larger than have been reported for some time.

Shipments for eight weeks past by these reports have been, in tons:

Week ending							
Oct. 30.	Nov. 6.	Nov. 13.	Nov. 20.	Nov. 27.	Dec. 4.	Dec. 11.	Dec. 18.
46,688	41,883	37,051	38,409	35,462	40,935	45,238	48,080

Shipments by the Chicago & Atlantic road are not included above; the through shipments over that road for the week are given at 4,880 tons. These shipments include dead freight only.

New Lake Tonnage.

The new tonnage to be placed in the lake carrying trade next season is larger in amount probably than that of any single year on record. The great stimulus to shipbuilding is the result of the profitable rates of freight paid the past season to carriers of grain and ore, and to the outlook for a prosperous season next year. A careful computation places the carrying capacity of the 57 vessels lost during the last year at 32,000 tons, while thus far it is known that at least 31 new boats, all but two being steamers, are under construction and contract and will be ready for next season's trade. The total carrying capacity of this large steam fleet will be fully 66,000 tons—more than twice the amount wiped out. Cleveland takes the lead in this building revival with 11 vessels, of which one schooner barge, the "Wadena," is already launched. Of the other 10 nine are steamers and four of these steel craft, averaging about 2,500 tons capacity, under contract with the Globe Co. The Quayles, who turned out the "Wadena," will build another schooner consort and two wooden steamers, each with capacity for 2,000 tons freight. Radcliffe is at work on two steamers of 2,300 and 2,000 tons capacity and Presley has on the stocks a 2,000-ton steamer. It is probable that Cleveland capitalists, who seem to have as much enterprise as faith, will look for more new craft before the season is done. Cleveland has been buying a great deal of tonnage from other ports of late, especially of this port, and in the matter of documented tonnage it to-day holds the position long conceded to Buffalo as being the leading lake port.

Buffalo comes second as far as the building boom is concerned. The 2,700-ton steamship "Susquehanna" has but recently been finished, and has, her owners claim, by the single trip she has made, proven herself a successful lake carrier. She is the first boat built on the lakes after salt water ideas, and marks the beginning of a new era in inland navigation. The Union Dry Dock Co. has under way a similar steel steamship for the Union Steamboat Co., and is to follow along with a duplicate for the same owners, each to have at least 2,800 tons freight room. R. Mills & Co. have well along in construction a wooden propeller of 2,000 tons capacity. There is so much repairing to be done here that the shipbuilders dare not undertake any more new work, though plenty of it has been offered.

Wheeler, at West Bay City, is getting out three steamers, duplicates in dimensions, which will carry about 2,100 tons each. One of these is for the Smith, Gratwick & Fryer Lumber Co., which has just sold its steam-barge "W. H. Gratwick." Captain Davidson, at the same port, is building a 2,000-ton steamer and will soon begin work on another of the same size. He has about decided to get out a third before the end of next season.

The Detroit Drydock Co. has contracts for building four steamers—two of 2,100 tons, one of 1,800 tons and one of 1,500 tons. Detroit builders have of late been much hindered by trouble with the Knights of Labor, but it is hoped that work will soon be pushed along there.

Wolf & Davidson, of Milwaukee, are at work on the "R. P. Flower," a steamer which is to have 2,300 tons capacity, and will hurry on another of 2,100 tons. It is probable that the Milwaukee Shipyard Co., which recently completed the "Veronica," will have another new one out by spring.

Craig, at Trenton, on the Detroit River, is engaged on duplicate steamers, each of which will hold about 2,200 tons freight, and another of about 1,400 tons.

Morley, of Marine City, is pushing along a 2,000-ton steamer, and Langell, at St. Clair, one of 2,100 tons.

The cost of these boats will be over $4,000,000. They will all be of the highest class recognized by the marine underwriters, and will all be available for many years for the grain and ore trades unless they should meet with misfortune. It is worth noting that three cylinder engines, of which the first on the lakes was given to the "Susquehanna," will be placed in at least six of the new steamers. It is claimed that better results can be obtained from triple compound and triple expansion engines than from any other kind.—*Buffalo Courier.*

The El Paso Traffic Association.

At a meeting in Dallas, Tex., Dec. 16, it was agreed to extend indefinitely the present agreement, which would have expired Dec. 31, 1886. The Missouri Pacific gave notice that it would withdraw from the pool, unless its demand regarding differential rates was acceded to. It is hoped that a compromise will be agreed to at a future meeting.

Restricting Passes.

President Roberts, of the Pennsylvania Railroad, has issued the following order:

"The attention of the officers of the Pennsylvania Railroad Co. and of the various lines embraced in the system, both east and west of Pittsburgh, is again called to the fact that large number of passes are issued to persons who are no wise entitled to receive them. All officers will hereafter be held to a more rigid observance of the rules governing the issue of passes both annual and trip; and it is expected that the reports of free travel will in future show a large decrease as compared with the current year."

Special Rates for Manufactories.

A Mobile correspondent of the *Northwestern Lumberman* says:

"The cat is out of the bag in the matter of the woodenware factory at Brewton, Ala. I told you last week why the enterprise had been abandoned—namely, because the company interested could not obtain special freight rates from the railroad. It turns out now that there was a possibility of a favorable arrangement, when the local newspaper put in its oar and stated that the company expected to get concessions in the matter of rates. Now, this sort of thing is not allowed; and there is a lynx-eyed Railroad Commission in Alabama which sits down like a pile driver on any discrimination, favorable or unfavorable. The fat was all in the fire at once, for the railroad would not think of giving special rates—not if anybody knew it—and the woodenware men received no answer to their numerous letters requesting concessions. I don't know which to admire most, the uprightness of the railroad or the enlightenment of the Legislature; both combining by means of the Railroad Commission to prevent the establishment of a manufacturing industry in a small town where there is little else than an industrial life, and where such an industry would give employment to 50 able-bodied citizens. If the Commission were infallible and really effected an abolition of discrimination, there would be some reason in its existence; but at the very time it is extinguishing this promising little industry. Mobile is catching it hot because of rates which are so unequal that she is losing, it is said, about a quarter of her wholesale trade."

East-bound Rates from Pittsburgh.

At meeting of the general freight agents of the Pittsburgh roads on Dec. 21, it was decided to advance the rates on 9th class, Pittsburgh to Boston, from 23 cents to 26 cents; and on 10th class from 20 cents to 23 cents. The latter class includes iron steel, and white lead. Rates to New York were correspondingly advanced.

Rates on Cotton Goods.

The Southern Railway & Steamship Association has decided to change the classification of cotton piece goods from the first to the third class, when shipped from New York and the East to southern points; and that the products of southern factories, when shipped North, shall be rated as fourth class instead as sixth class as heretofore. These changes will take effect on Jan. 1, 1887.

Pools as Rate Regulators.

The Chicago *Times* says: "Since the first railroad pool was made, somewhere about 1875, the prices for the transportation of freight and passengers have been reduced nearly 50 per cent.; and as a regulator of rates they have recorded a series of unbroken failures."

New England Traffic Notes.

The steamer "Wm. T. Hart" of the New York & New England road transferred across the Hudson at Fishkill in November the following number of cars: West-bound, 3 322 empties and 514 loaded cars, total 3,836; east-bound, 68 empty and 3,302 loaded cars, 1,857 of the latter being coal laden.

Southern Railway & Steamship Association.

The Board of Arbitration of this association recently held a session in New York, at which several cases were decided as follows:

1. Cotton factory products from Southern mills, heretofore in the sixth class, are to be placed in the fourth class, taking effect Jan. 1. Paper products from Southern mills are to remain in the sixth class as heretofore.

2. Milling in transit is practically a form of re-billing and if sanctioned in one case it cannot fairly be denied in other similar ones. The policy of the Association has always been opposed to re-billing, and the Board therefore decides that milling in transit, as practiced by the Western & Atlantic Co., be discontinued.

3. In the case of the demand of the Louisville & Nashville for a division of the apportionment of the cotton to the Atlanta & West Point Road at Atlanta for the season of 1884–85, the board decides that it was competent under the agreement for the Atlanta & West Point to determine to subdivision of allotments. The award is that of the 3 per cent. allotted to the Atlanta & West Point by its controlling system the Louisville & Nashville is entitled to its *pro rata* share, to be ascertained from the records of the general commissioner's office. No division is made as to the season of 1885-86.

Weight of Refrigerator Cars.

In compliance with a resolution adopted by the Central Traffic Association at its meeting on Dec. 14, Commissioner Blanchard requests that all refrigerator cars be weighed and the weight of the car and of the ice each car will hold in its ice chambers be stenciled upon the car, and a statement of such weight be furnished to his office in Chicago.

RAILROAD LAW.

New Jersey Railroad Taxation.

In Trenton, N. J., Dec. 20, Chief Justice Beasley filed an opinion in the railroad tax cases deciding the points reserved by the Supreme Court when it declared the Railroad Tax act constitutional. The Court says:

"In estimating the value of railroad property, the cost of the acquisition of such property is not an absolute criterion of such value, but it is an important element in the circumstances on which a judgment on the subject is to be formed. The law directs the valuation of the property of these two classes of companies to be made in a distributive mode; that is, first, on the main stem; second, on the other real estate used for railroad purposes; third, the tangible personal property; and, fourth, on the franchises. *Held* that such system of valuations has been declared by the Court of Errors to be constitutional and unobjectionable. Further held that the valuations of such property, including the franchise, is legal, and as there is no clear evidence showing the value to be exorbitant they cannot be modified.

"The act in section 6 direct that whenever, in any taxing district, there are several branch roads belonging to or controlled by one company, the State Board shall designate one of such lines as the main stem, and that the others shall be valued as property used for railroad purposes, thereby subjecting such respective parts of the property thus separated to a different rate of taxation. *Held*, that although such distribution of property with a view to variant taxation was to be justified by force of the decision in these cases by the Court of Errors, still such system was invalid, inasmuch as it left it to the unguided judgment of the State Board to decide which of such branches should be subjected to the higher rate of taxation.

"Section 4 of the act directs that in case the valuations of the State Board of railroad and canal property shall be relatively higher than the value of the property of other persons in any taxing district, as ascertained by the local assessors, the said board should accept as a correct standard of value the valuations of such local assessors. It was shown that the local assessors illegally took but a percentage of what they deemed the true value of the property appraised by them. *Held*, that the State Board could not take such reduced valuations as its standard of value.

"Section 9 of the act provides that in case of a railroad of this state being under lease to a foreign corporation, any tangible personal property of such foreign company, if used or kept but a part of the time in this state, shall be assessed such proportionate part of its value as the time it is used or kept in this state during the year preceding Jan. 1 designated in this act bears to the whole year, and it appearing that certain engines and cars that were used on its leased lines in this state by the Philadelphia & Reading Railroad Co. in the course of interstate commerce, such company having in use a full local equipment of such leased lines, which was duly taxed in this state, it is *held* that the tax upon such property employed in interstate commerce was illegal, being in contravention of that clause of the Constitution of the United States that gives to Congress the exclusive regulation of commerce between the several states."

The Pennsylvania Pool Suits.

The suits brought by the Attorney General of Pennsylvania against the anthracite coal combination and the trunk line pool are, it is stated, to be actively pressed. The Court of Common Pleas at Harrisburg having granted the Attorney General an order to take testimony, proceedings under this rule began in Philadelphia, Dec. 16. The first witness called in the coal combination case was Mr. Joseph S. Harris, President of the Lehigh Coal & Navigation Co. Mr. Harris, however, acting under the advice of his counsel, declined to answer the questions put to him, and nothing further could be done.

On the following day Mr. George B. Roberts, President of the Pennsylvania Railroad Co., was put on the stand, and testified that he was chairman of the trunk line presidents' meeting which formed an agreement in 1885. Mr. Roberts testified at some length, saying that the pool was not intended to enable the companies to get higher rates, but to prevent continual fluctuation in rates. Many questions were asked, but developed nothing new.

In Harrisburg, Dec. 21, the Attorney General reported to the Court and asked for the appointment of examiners to take testimony. The motion was not opposed and was granted by the Court.

OLD AND NEW ROADS.

Alabama Great Southern.—A dispatch from Montgomery, Ala., Dec. 21, says: "A decision has just been rendered by the Supreme Court of Alabama in a case which involves the title to several million dollars' worth of lands originally donated to the Alabama & Chattanooga Railroad Company by Congress. The suit was brought by Jefferson County in the chancery court to compel the trustees to make a legal title to 40 acres of land in sight of Birmingham worth $50,000. The Supreme Court decides on appeal that all sales made before the completion of the road are void except 120 sections of land on the first 20 miles near Chattanooga, unless they were made in strict conformity with the act of Congress of the year 1856 donating the lands. As none of the sales made before the completion of the road did conform to the act, all are void. All sales made since the completion in 1871 are good. As the road runs through the richest mineral districts of Alabama from Chatanooga to Meridian, the void sales amount to millions of dollars, the lands having within the past few years increased enormously in value."

Atchison, Topeka & Santa Fe.—In the suit of Clarence H. Venner, Judge Wallace, of the United States Circuit Court, has issued an injunction restraining the Farmers' Loan & Trust Co. from delivering the $3,400,000 of Atchison stock Jan. 1, 1887, to the former stockholders of the Gulf, Colorado & Santa Fé Co., pending decision on the application for a permanent injunction.

The Venner suit to enjoin this company from extending its line to Chicago and from guaranteeing the Atlantic & Pacific bonds came up in the United States Circuit Court in St. Paul, Dec. 20, when arguments began and were expected to continue for several days.

In the suit to enjoin the issue of stock for the purchase of the Gulf, Colorado & Santa Fe, the United States Circuit Court in New York, Dec. 22, denied the motion for an injunction, but prolonged the preliminary stay until Dec. 29, with leave to the plaintiff to revive the motion for an injunction if, in the meantime, a decree is rendered in favor of the plaintiff in the Kansas suit.

Baltimore & Ohio.—A report is current that this company has made an offer to buy and complete the South Pennsylvania road. The report is not improbable, but it is impossible to secure any official confirmation.

Boston & Albany.—This company has granted the request of the brakemen for an increase in pay, varying from 15 to 25 cents a day. The request that the brakemen's work be limited to 10 hours work a day could not be complied with, owing to the nature of the business.

Buffalo, New York & Philadelphia.—Plans have been prepared for new shops in Buffalo, N. Y. These plans include a planing mill 75 by 110 ft., a storehouse 40 by 75, a car repair shop 100 by 50, a lumber shed 30 by 50 ft. Besides these shops for the car department there will be a machine shop 80 by 200 ft., with a blacksmith shop 75 by 110 ft. A boiler house, a paint shop and an oil house are also proposed as additions. It is uncertain when work will be begun on the new shops, but probably as soon as the road passes into the hands of the new company when its reorganization is completed.

Buffalo, Rochester & Pittsburgh.—The Union Trust Co., of New York, last week obtained a judgment for $1,046,712 against the Rochester & Pittsburgh Railroad, in Pennsylvania, by the decision of Judge Acheson in the United States Circuit Court at Pittsburgh, Pa. This suit involved the question of the right to hold the property in Pennsylvania under a judgment rendered in New York state, and the opinion of the Judge is broad in holding that the road in Pennsylvania is entirely subject to such a judgment rendered in New York.

Camden & Rockland.—This company has been organized to build a railroad from Camden, Me., through Rockport to a junction with the Knox & Lincoln road at Rockland, Me. The road will be about 9 miles long, following closely the western shore of Penobscot Bay. The Maine Railroad Commissioners have approved the project and authorized the organization of the company.

Central Pacific.—The statement for September and the nine months to Sept. 30 is as follows:

	September.	Nine months.
Earnings	$1,555,411	$11,798,251
Expenses	691,135	5,333,940
Net earnings	$864,276	$6,464,311
Fixed charges	559,453	5,035,077
Construction and improvement	4,716	69,882
Total charges	$464,169	$5,104,959
Surplus	$300,107	$1,359,352

Fixed charges include interest, rentals, taxes and the requirements for the government sinking fund.

Central, of Georgia.—The annual meeting was held in Savannah, Ga., Dec. 22, but only routine business was transacted, both the Raoul and the Alexander parties declining any vote which might be a test of strength. The election of directors does not take place until Jan. 3.

Charleston, Cincinnati & Chicago.—This company, it is reported, has bought the Chattaroi Railroad in Kentucky with a view to using it as part of its projected line.

Chattaroi.—It is reported that this road has been sold to the Charleston, Cincinnati & Chicago Co., which is now building a line in South Carolina. That company proposes making the Chattaroi road part of its extension to the Ohio River. The Chattaroi road extends from Ashland, Ky., south to Richardson, 50 miles.

Chesapeake & Ohio.—Two bondholders have commenced an action in the New York Supreme Court against the Chesapeake & Ohio Railroad Co. and the Central Trust Co. of New York, to restrain the railroad company from applying its revenues to the detriment of the holders of the bonds of series B. It is charged that the company is discriminating against the bonds of this series by paying only part of the interest in cash, while the interest on series A is paid in full. It is also charged that those bondholders of series B who assented to the scaling of the interest from 6 to 4 per cent. are paid 4 per cent., while those who did not consent are paid but a fraction of their interest in cash.

Mr. Huntington, under date of Nov. 27, issued a circular to bondholders setting forth at length the reasons why they should adopt his proposed plan of exchanging their securities.

Chicago, Milwaukee & St. Paul.—A dispatch of Dec. 22, from St. Paul, Minn., says: "In the Supreme Court yesterday a decision was filed declaring that the charter of the Hastings & Dakota and Minnesota railroad companies are forfeited and the corporations dissolved. After constructing these roads some years ago the companies sold them to the Chicago, Milwaukee & St. Paul Co., reserving the land grants as railroad companies, free from taxation. Under the decision many thousands of acres of these lands will become taxable. The section of road mentioned as sold to the Chicago, Milwaukee & St. Paul Co. are that part of the Hastings & Dakota between Glencoe and the state line and the line from Minneapolis to Benton.

The new passenger station in Milwaukee, one of the finest in the West, was opened for business Dec. 19; it is thus described:

"The structure faces the Fourth ward park from the south, and the open square affords a fine view of its architectural beauty. It is 300 ft. long, three stories high, with a tower rising from the centre, in which is located a large illuminated clock. Passenger trains run along the south side of the depot. The six tracks which have been built for their accommodation are covered with sheds 450 feet in length. Passengers arriving and departing enter the depot through wide vestibules, supported by heavy granite columns, which are located at the centre of the building, on the north and south sides.

"The grand entrance hall, into which the passenger enters, is 18 ft. high, as are all the rooms on the main floor. Its walls are finished with bright glazed brick arranged harmoniously in different colors. Trimmings and cornices are of red terra cotta. The floor is of tiling, arranged in symmetrical figures, and in harmony with other rooms on the main floor. The main hall is lighted from windows in the second story, a portion of the ceiling being cut out to admit the light. The opening is surrounded with a railing and a gallery thus formed, from which a fine view of the southern part of the city, and of the trains entering or leaving the city, can be obtained.

"Entering the depot from the northern entrance, the ticket office will be found at the centre of the large hall, on the right hand side. It is located midway between the entrances to the ladies' and gentlemen's waiting-rooms, and will have an opening toward each waiting-room, as well as toward the hall. The waiting-rooms are made by dividing the building with a partition running east and west. They are light and roomy. All will be wainscotted with Wisconsin red oak, finished in simple yet attractive style. The ceilings will be finished in wood panels, and will be supported by ornamental iron columns.

"At the extreme western end of the building is the portion devoted to the storage of baggage. It is finished in less expensive style. The three stories are connected with an elevator.

"On the left hand side, as the visitor enters the northerly entrance, is a large and spacious dining hall, a lunch room, a telegraph office and parcel room, where the various conveniences afforded by such institutions are provided. Beyond these, and in the east end of the building, are the quarters designed for use by emigrants. Both the first and second floors are devoted to that purpose. The emigrants will have the free use of commodious wash and bath-rooms.

"West of the main hall the second floor is divided into small rooms which will be used as offices for the division superintendents and train dispatchers of the several divisions of the Chicago, Milwaukee & St. Paul which have their offices in Milwaukee. East of the main hall there are a number of rooms for the use of employés of the restaurant, and a few rooms for the use of transients. The second floor is neatly finished in hardwood and Georgia pine woodwork. The third floor has been finished and will be used for storage purposes.

"The building is heated throughout by steam, which is furnished by two large smoke consuming boilers located in the basement. A 100 H.P. Corliss engine runs the dynamo for the electric lights for the entire building, the big clock and the yards."

Chicago, Rock Island & Pacific.—Track on this company's Chicago, Kansas & Nebraska line is now completed to Sabetha, Kan., 60 miles westward from St. Joseph, Mo., and 14 miles beyond the last point noted. The work is progressing as rapidly as the weather will permit.

Chicago & St. Louis.—A report was noted last week, to the effect that this road had been sold to the Atchison, Topeka & Santa Fe Co. It is now announced that the sale is to the Chicago, Santa Fe & California, a company recently incorporated and generally understood to be in the Santa Fe interest.

Chicago, Santa Fe & California.—This company announces that it has bought the Chicago & St. Louis road, and will hereafter operate that road as its Chicago Division. Surveys have been begun for extensions from Pekin, Ill., to the Mississippi.

This company was recently organized and is supposed to be in the Atchison, Topeka & Santa Fe interest.

Cincinnati, Jackson & Mackinaw.—Track on this road is now completed to Farmersville, in Montgomery County, O., 10 miles southward from the late terminus at West Alexandria and 120 miles from the northern terminus at Cecil. Trains have begun to run to the new terminus. Tracklaying is in progress from Farmersville southward to Germantown, but no work will be done beyond Germantown until spring.

Colorado Midland.—The first section of this road, from Colorado Springs, Col., to the Platte River, is now entirely graded, with tracklaying in progress. Contracts have been let for the grading of the 50 miles of the line from Hilltop to Leadville to W. C. Bradbury & Co., C. Lape & Co., and Streator & McMurtrie.

Connecticut Central.—In the foreclosure suit against this road the Connecticut Supreme Court has reversed the decision of the lower court. The New York & New England Co., having purchased all the first mortgage bonds of the Connecticut Central, leased the road, agreeing to pay the stockholders the net earnings as rental. Under its management the Central had no net earnings and defaulted in the interest on the bonds, and proceedings were therefore begun to foreclose the mortgage. The stockholders contested the suit, claiming that under the proper method of accounting it will be shown that the road had earned the interest. The Superior Court granted the decree of foreclosure and the case was appealed. The Supreme Court now sets aside the decree and orders the lessee to make an accounting of the earnings.

Denton & Northwestern.—This company has been organized to build a railroad from Denton, Tex., to a junction with the Gulf, Colorado & Santa Fe road. It will be about 10 miles long.

Fitchburg.—The Boston *Advertiser* of Dec. 20 says: "The complete plan of the Fitchburg Railroad for the perfection of its western connections appears not to be confined to a consolidation of the state road and a control of the Hoosac Tunnel, but to be more far-reaching. It is understood that that company has for a long time been negotiating with the directors of the Troy & Boston road for a consolidation with that company. These negotiations are now nearly consummated, and, it is believed, only await the final adjustment of the tunnel matter for completion. It is understood that the directors of the Troy & Boston are a unit in this matter, and that the sentiment of a majority of the stockholders, as expressed, is also favorable to the arrangement.

"A similar rumor exists relative to the Boston, Hoosac Tunnel & Western Railroad, and it is not at all improbable that a consolidation of both of these New York roads with the Fitchburg are matters of the near feature.

"The effect of this arrangement, if consummated, may be briefly stated. The commonwealth of Massachusetts is the owner of a little railroad 6 miles in length, crossing the extreme southwest corner of the state of Vermont, and connecting the Troy & Greenfield, also the property of the state, on the south, with the Troy & Boston on the north, the first ending at the state line, dividing Massachusetts and Vermont, and the last-named beginning at the State line of Vermont and New York. This little connecting link is known as the Southern Vermont Railroad, and is leased to the Troy & Boston. The latter extends from this point by a somewhat circuitous route, owing to the nature of the country, to Troy, a distance of 35 miles.

"The Troy & Boston also leases the Troy & Bennington, another little road about 6 miles in length, which connects at Bennington, Vt., with the Bennington & Rutland, and thence with the Central Vermont.

"The Boston, Hoosac Tunnel & Western has its eastern terminus also at the New York and Vermont state line, connecting with the Southern Vermont, and stretches to Rotterdam Junction, a distance of about 61 miles, where connection is made with the West Shore. This road also leases the Saratoga Lake Railway, running from Saratoga to Ketchum's Corner, N. Y., a distance of 5½ miles, and also the Hoosac Tunnel & Saratoga Railroad, extending from Ketchum's Corner to Saratoga Junction, a distance of 7½ miles, and from Schuylerville Junction to Schuylerville, a distance of 8 miles.

"The Fitchburg has now a double all-steel track the entire length of its own road and of its leasehold, the Vermont & Massachusetts. The Troy & Greenfield and the Southern Vermont roads are also double tracked. The Troy & Boston and the Boston, Hoosac Tunnel & Western are single tracked with sidings, all-steel rails and standard gauge.

"The complete consummation of this plan will give the Fitchburg road a continuous track, of 191 miles, exclusive of extensions, to Troy, and of 217 miles to Rotterdam Junction."

Fort Worth & Denver City.—The track on the extension of this road is now laid to Chillicothe, Tex., 17 miles beyond the late terminus at Vernon, and 180 miles from Fort Worth. Regular trains have begun to run to Vernon, 163 miles from Fort Worth. The grading is completed for 12 miles beyond the present end of the track, to Quanah, and the rails are going down. Quanah will be the operating terminus for a time, although it is expected that the Panhandle Construction Co. will soon begin work on its contract to build the 200 miles, which will carry the road to the Canadian ...ver.

Georgia Midland & Gulf.—The track on this road is now laid to Waverly Hall, 26 miles northeast of Columbus, Ga. The grading is completed for 40 miles and the tunnel through Pine Mountain is nearly finished.

Grand Trunk.—The statement for October and the four months from July 1 to Oct. 31, as published in London, is as follows :

	October.		Four months.	
	1886.	1885.	1886.	1885.
Earnings	£334,250	£298,963	£1,280,641	£1,191,898
Expenses	228,513	216,917	871,298	822,419
Net earnings	£105,737	£82,046	£409,343	£269,479

For the four months the gross earnings increased £188,743, or 17.3 per cent., and the expenses £48,879, or 5.9 per cent., leaving a gain of £139,864, or 53.9 per cent., in the net earnings.

The statement for the controlled lines west of Detroit for the four months is as follows:

	C. & G. T.		D., G. H. & M.	
	1886	1885.	1886.	1885.
Earnings	£221,370	£182,750	£96,197	£92,372
Expenses	164,473	154,181	59,190	61,648
Net earnings	£56,897	£28,569	£37,007	£30,724

On the Chicago & Grand Trunk the gross earnings increased £38,620, or 21.1 per cent., and the net earnings £28,328, or 99.2 per cent. The Detroit, Grand Haven & Milwaukee shows a gain of £3,825, or 4.1 per cent., in gross earnings, and of £6,283, or 20.5 per cent. in net earnings.

Haverhill & Lawrence.—The Massachusetts Railroad Commissioners have decided that an exigency exists for the construction of this proposed road, and the company will, therefore, be authorized to complete its organization and proceed to build the road. It is to run from Haverhill, Mass., to Lawrence, about 7 miles.

Helena, Boulder Valley & Butte.—This road, which is built in the interest of the Northern Pacific, leaves the Wickes Branch of that road 20 miles south of Helena, Mon., and is to run to Butte, This road has been located for 20 miles and that portion is under contract, with a large force of men and teams at work. The location of this line required some difficult work.

Helena & Northern.—A section of this road is to be built at once, extending from a junction with the Northern Pacific, 7 miles west of Helena, Mont., to Manzanilla, where there are extensive mines and reduction works. The location of this line is nearly completed, and it will be put under construction at once, to be completed next summer.

Helena & Red Mountain.—As heretofore noted, the work of laying track on the main line of this road has been completed. The road starts from a junction with the Canadian Pacific, 2 miles west of Helena, Mont., and runs southwest to the silver mines at Rimini, a distance of 15.85 miles, and 1.25 miles of siding have been laid. At the junction with the Northern Pacific the elevation is 3,908 ft. above tidewater and the terminus is 5,350 ft. above, a rise of 1,442 ft., being an average of 91 ft. to the mile. The grade is level for 0¾ mile and for the next 8 miles the road conforms nearly to the surface of the country, with an average grade of 1½ per cent. or 79.2 ft. per mile. For the remaining 5 miles the grade on tangents is about 3 per cent. or 158.4 ft. per mile. There are no curves of over 5 degrees, and very few curves for a mountain road, 14½ miles of the entire distance being tangents.

Housatonic.—At the annual meeting in Bridgeport last week two new directors were chosen to the board, who are understood to represent the interest in the stocks lately acquired by the Bostwick party, which at present controls the New York & New England road.

Housatonic Valley.—This company has been organized to build a railroad from Birmingham, Conn., on the New Haven & Derby, to Hawleyville on the Housatonic road. The projected line will be 15 miles long, and will complete a short line from New Haven to Danbury.

International.—A dispatch from Farmington, Me., Dec. 21, says: "The engineers arrived at Phillips to-day. They are employed by the International Railroad Co. in connection with the Maine Central to locate the most feasible route for the connection of these railroads, and they have prospected by way of the chain of ponds, Eustis, Kingfield and Strong. From here they took a route over to Rangely by way of Sandy River Pond. On their return here they will go by way of Perham, Redington and Copeland, again looking the route over, and, if a satisfactory route is found, it is probable that a survey will be made during the coming summer for an outlet for the International road through this country.

Iron Range Northern.—This company has been organized to build a railroad from some point on the Duluth & Iron Range to a connection with the Canadian Pacific. The object of the road, besides making the connection, is to develop the iron mines to the northward of Vermillion Lake.

Kansas City, Memphis & Birmingham.—This company is contemplating the building of a branch from a point on the main road near Cotton Gin Port to Aberdeen, Miss. Surveys are now in progress for this branch.

Kansas City, Springfield & Memphis.—Surveys are now being made for this company's proposed bridge over the Mississippi at Memphis, Tenn. Some doubt has been expressed as to the possibility of securing proper foundations, but the engineer in charge reports that he has found, at a depth of 125 ft., a stratum of clay sufficiently solid to carry the foundation of the bridge on the Arkansas side. The company will begin work as soon as the necessary authority is obtained from Congress.

Kansas City, Wyandotte & Northwestern.—Grading on this road is now reported completed for 30 miles west from Wyandotte, Kan., and track has been laid for 4 miles. Tracklaying is advancing steadily.

Kansas, Nebraska & Dakota.—The first through timetable of this road shows two passenger and two regular freight trains daily each way between Topeka, Kan., and Fort Scott. The stations, with the distances from Fort Scott, are : Woodland, 5.6; Devon, 10; Mapleton, 19; Summit, 23.2; Blue Mound, 29.6; Laura, 36.8; Bush City, 42.2; Garnet, 50; Glenlock, 58; Harris, 63.5; Mineral Point, 67.2; Waverly, 74.2; Rosemont, 82; Quenemo, 89; Michigan, 97; Overbrook, 104.2; Swissvale, 109; Richland, 115; Tevis, 120; South Topeka, 129.4; Topeka, 130.4 miles.

Kansas, Nebraska & Minnesota.—This company has filed articles of incorporation to build a railroad from Lakin, Kan., to the Nebraska line, and thence through Nebraska and Minnesota to Duluth.

Kentucky Central.—A decree of foreclosure is expected in January. It is proposed to exchange the general mortgage bonds into a new bond bearing 4 per cent. for first few years and then 5 per cent.

Manistee & Northern.—Arrangements are being made to build a railroad from Manistee, Mich., northward into the pine woods. About 20 miles will probably be built next season, and the road will be used chiefly for logging purposes.

Memphis & Nashville.—Surveying parties are now going over the line of this projected road, and it is understood that arrangements have been made under which the road is to be built by the Virginia Construction Co., an organization in which the new owners of the Richmond & Danville are largely interested.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Dec. 11 :

The expired concession for a railroad in the State of San Luis Potosi, from the Potrero to the Cedral, has been revived and extended, and transferred to Gov. Diez Gutierrez in his private capacity. A guarantee of $20,000 in bonds of the public debt is required of the concessionaire.

Government engineers have recommended the construction of retaining walls, and the making of other improvements to promote safe railroad transit through the Tajo of Nochistongo. It is asserted that the wooden gutters carrying off the surplus rainwater from the top of the Tajo need to be carried out farther so as to prevent washing away the side of the cut where the railway runs. It is proposed also to move the track farther inward wherever there is sufficient space for this object.

The *Revista Comercial*, of Tepic, says that Mr. John E. Early, resident representative of the Mexican Central, has received orders to take up all the material which was employed on the part of the branch road which was to unite Tepic with San Blas, and which it was the original plan of the railroad company to continue to the city of Guadalajara. The branch had only reached the town of Huaristemba, on its way to Tepic. On the receipt of the news that the rails, etc., were to be removed, there was some excitement at Tepic, and the house of Barron Forbes & Co. called a meeting of the local merchants, and action was taken looking to securing the aid of the town government in preventing the destruction of the railroad. There was some talk of subsidizing the company at the rate of $500 per kilometer or to build the branch at the expense of the local merchants

In its recent negotiations with the government the Central Railroad Co. asked that it should be allowed to give over the building of its branches to Tampico and Guadalajara to a corporation to be known as the "Mexican Central Construction Co." But the government had heard too much of construction companies, and refused to grant the privilege. However, the government, with a sagacity for which it deserves some credit, did permit the Central people to put their branches into the hands of one or more independent companies which are to enjoy all the franchises and privileges which pertained to the Central Co. under its concession. And it is to be noted that the government, so far from allowing the Central Co. to get rid of its obligations with regard to the branch lines, stipulated that the Central should be responsible for the due fulfillment of its contract with the government as regards the branches. That is, the independent company, or companies, may build the lines, but the Central is responsible that the branches are built just as the original concession says they shall be. The Central asked for a very ample modification of its concession, but it did not receive nearly as many privileges as it desired to obtain.

Michigan & Ohio.—The United States Circuit Court has confirmed the foreclosure sale of this road under which it was bought in by the bondholders' committee. The Court directs that the deed for the property be not delivered until further order is made in the case.

Minneapolis, Sault Ste. Marie & Atlantic.—This company, it is stated, has succeeded in negotiating a large amount of its bonds and is making arrangements to press actual work on construction on its line eastward next season.

Mobile & Northwestern.—In the suit brought to foreclose the mortgage on this road, the United States Circuit Court at Oxford, Miss., has appointed a receiver to take charge of the property, pending further proceedings. The road extends from Glendale, Miss., to Clarksdale, 30 miles.

Nashville, Chattanooga & St. Louis.—The statement for November and the five months of the fiscal year from July 1 to Nov. 30 is as follows :

	November.		Five months.	
	1886.	1885.	1886	1885.
Earnings	$213,768	$181,488	$1,090 023	$913,982
Expenses	122,496	107,294	633,743	540,735
Net earnings	$91,272	$74,194	$456,280	$373,247
Interest and taxes			294,165	281.471
Improvements			31,010	22,592
Total charges			$325,175	$304,063
Surplus			$131,105	$69,184

For the five months this shows an increase of $176,041, or 19.2 per cent., in gross earnings ; of $83,033, or 22.2 per cent., in net earnings, and of $61,921, or 89.7 per cent., in the surplus over all charges.

New York Central & Hudson River.—This company announces an advance in the pay of the freight conductors and brakemen, and also in the switchmen employed in the yards.

The statement for the quarter ending Sept. 30 is as follows

	1886.	1885.	Increase.	P. c.
Earnings	$8,717,147	$6,053,415	$2,663,732	44.0
Expenses	4.877,675	4,500,207	377,468	8.4
Net earnings	$3,839,472	$1,553,208	$2,286,264	147.2
First charges	1.926,886	1,463,726	465,160	31.6
Profit	$1,912,586	$89,482	$1,823,104	....
Dividend	894,283	447,142	447,141	100.0
Surplus	$1,018,303	*$357,660	$1,375,963	....

* Deficit.

The expenses were 55.95 per cent. of gross earnings this year, against 74.34 last year. The profit was 2.14 per cent. on the stock, against 0.10 last year. A statement for the year will be found elsewhere.

New York, Chicago & St. Louis.—In the suit brought by the Central Trust Co., as trustee, to foreclose the mortgages on this road, the company has filed an answer. This answer avers that the proceedings by which the companies organized in New York, Pennsylvania, Ohio, Indiana and Illinois were consolidated were not legally completed, and were without authority and void, and that the bonds are therefore worthless. It further claims that, even if it be admitted that the present corporation is a legal one, organized under the laws of the several states through which it passes, and with authority to issue bonds, those bonds were actually issued without due consideration, either in money or property, thus violating the laws of Pennsylvania, and therefore the bonds and the mortgages executed to secure their payments are void, and that a decree for the sale of the road for the purpose of paying those bonds would be illegal.

This answer in the foreclosure suit was generally anticipated. Should the Court sustain the ground taken by the company the bondholders will be placed on a par with the floating debt creditors, having only a claim for the money actually advanced by them, with usual interest, and they will have no priority of lien. An extended litigation is probable, unless some compromise is made.

New York, Susquehanna & Western.—The directors of this company have adopted a plan for the relief of the company. It is proposed to issue new 50-year 5 per cent. gold bonds to the extent of $3,750,000 with part of which to retire the present 6 per cent. bonds, the interest scrip (about $150,000) and the car trusts. It was stated that the reduction in the interest rate had been made with the approval of some of the largest bondholders, and that the greater part of the amount would be exchanged immediately. The coupon on the present mortgage due Jan. 1 will be paid at the rate of 5 per cent. per annum, at the Central Trust Co. in New York. A second mortgage for $1,000,000 has been authorized to retire the $600,000 of debenture bonds and $36,000 of scrip, and also for the purpose of double tracking the road to Paterson and purchasing additional equipment.

Pennsylvania.—The statement of the business of all lines east of Pittsburg and Erie for November, 1886, as compared with the same month in 1885, shows an increase in gross earnings of $375,679; an increase in expenses of $465,243; a decrease in net earnings of $89,564. The 11 months of 1886, as compared with the same period of 1885, show an increase in gross earnings of $4,382,509; an increase in expenses of $2,797,276; an increase in net earnings $1,585,233. Carrying out these comparisons, we have the following :

	November.		Eleven months.	
	1886	1885.	1886.	1885.
Earnings	$,347,219	$3,971 540	$45,950,856	$41 568.347
Expenses	2,820,408	2,355,255	29,589,553	26,792,277
Net earnings	$1,526,721	$1,616,285	$16,361,303	$14,776,070

All lines west of Pittsburgh and Erie for the 11 months of 1886 show a surplus over all liabilities of $22,455, being an increase, as compared with the same period of 1885, of $1,187,346.

Philadelphia & Reading.—At an informal conference in Philadelphia last week, at which a number of holders of general mortgage bonds were present, the reorganization plan presented by the trustees was disapproved, and it was decided to press the foreclosure proceedings without further delay. A meeting of the general mortgage bondholders will be called as soon as possible.

It is said that holders of the first and second series 5s are also indisposed to join in the reorganization plan, and it seems to be very doubtful as to whether it will be accepted.

The General Mortgage Bondholders' Committee met in Philadelphia, Dec. 22, and adopted resolutions declaring the reorganization plan unjust, uncertain, and indefinite; that reorganization under it will be unduly expensive; that it is more objectionable than the plans that have preceded it; that the general mortgage bondholders be advised against depositing their bonds under the proposed plan, and that as soon as the Master's report in the foreclosure suit is filed counsel for the committee be instructed to secure a final decree that a sale may take place at the earliest possible date.

Pittsboro.—This road is now completed to Pittsboro, N. C. It is 11 miles long, extending from the town named to Moncure, on the Raleigh & Gaston air line. A formal opening of the road will be made in a short time with appropriate ceremonies.

Pittsburgh, Cincinnati & St. Louis.—The contract for 4 sections of the new Cincinnati & Richmond Branch of this road has been awarded to the firm of J. D. Gonder & Bros., of Strasburg, Pa. This firm is at present finishing a contract for straightening the tracks of the Pennsylvania Railroad near Elizabethtown, Pa., and will shortly begin work on the new contract.

Rochester & Lake Ontario.—This company, owning a short suburban line, used chiefly for summer travel from Rochester, N. Y., to the lake, reports its gross earnings for the year ending Sept. 30 at $17,798. The net earnings, after deducting working expenses and taxes, were $7,851. Dividends (11 per cent.) absorbed $7,150, leaving $701 on hand. The road carried 146,374 passengers, the average fare being 12.16 cents and the average cost 7.13 cents, leaving a profit of 5.03 cents. The road is 6 miles long.

St. Joseph & Grand Island.—This company has completed one of its new branch lines from the main line at Fairfield, Neb., northward to Clay Centre, 7 miles. The branch is graded from Clay Centre northeast to Sutton, 14 miles, with tracklaying in progress.

St. Louis, Salem & Little Rock.—This road, which was recently sold under foreclosure, has been purchased by the St. Louis & San Francisco Co. and will hereafter be operated by that company. The road extends from Cuba Junction, Mo., to Salem, 40 miles, with several short branches to iron mines.

St. Louis & San Francisco.—The following from General Passenger Agent D. Wishart is dated St. Louis, Dec. 6 :

"The St. Louis, Salem & Little Rock Railroad, completed and in operation between Cuba Junction, Mo., and Salem, Mo. (40 miles) has been purchased by this company, and will hereafter be known and operated as the Salem Branch of St. Louis & San Francisco Railway.

"Passenger agents are respectfully requested to prepare and place on sale tickets to Salem, Mo.; but one coupon is required from St. Louis, which should read 'via St. Louis & San Francisco Railway.'"

Savannah, Dublin & Western.—The suit brought by Murphy & Co., sub-contractors, against this company, in which the appointment of a receiver was asked for, has been withdrawn. It is stated that the suit was brought on account of a misunderstanding and that the claims on which it was based had been settled.

Scioto Valley.—The revival of the iron interests has improved the earnings of this road sufficiently to pay the whole interest on the funded debt, but considerable outlay has been made for betterments. It is reported that a compromise between the several interests is proposed on a basis of 6 per cent. on the first mortgage bonds of 1896 and 5 per cent on the seconds and consols.

Southern Pacific Co.—The October statement of this company is as follows:

	Atlantic Sys.	Pacific Sys.	Total.
Earnings	$775,106	$2.116.230	$2,891,336
Expenses	600,744	1.062,054	1,662,798
Net earnings	$174,362	$1,054,176	$1,228,538
Rentals received			46,680
Total income			$1,275,218
Interest, rentals, taxes, etc.		$1,162,836	
Construction and improvements		96,726	
			1,259,562
Surplus for the month			$15,656

For the ten months to Oct. 31 the gross earnings of th

whole system were $26,132,090; net earnings, $11,196,740; net income, $11,683,545. The fixed charges amounted to $11,628,360 and construction to $354,797, a total of $11,983,157, leaving a deficit of $319,612.

The earnings of the Atlantic System in detail for October were as follows:

	Gross earn.		Net earnings.	
	1886	1885.	1886	1885.
Gal., Har. & S. A	$220,236	$319,806	$16,666	$162,399
G. W., Texas & Pacific	3,283	5,413	*2,421	*825
Louisiana Western	52,011	59,615	25,793	32,395
Morgan's La. & Texas	395,062	427,958	91,170	233,584
N. Y., Texas & Mexican	17,729	26,725	4,001	9,602
Texas & New Orleans	86,785	91,665	36 213	44,665
Total	$775,106	$931,182	$174,362	$481,820

* Deficit.

The total decrease in gross earnings was $156,076, or 16.8 per cent.; in net earnings, $307,458, or 63.8 per cent.

South Pennsylvania.—A meeting of the subscribers to the syndicate for building this road was held in New York, Dec. 21. The object of the meeting was kept secret, but the current report is that it was held to consider an offer for the sale of the road as it stands to the Baltimore & Ohio, that company agreeing to complete the road and operate it as an independent and competing line. Another statement is that the sale is to Mr. Robert Garrett individually.

In the injunction suit to restrain the transfer of the stock to the Pennsylvania Railroad Company, elaborate answers have been filed, making a general denial of the allegations of the attorney general in the suit.

Strikes.—The strike of the freight conductors and brakemen on the Louisville, New Albany & Chicago road ended Dec. 16, only two days after it began. On that day a conference was held between a committee appointed by the strikers and officers of the road. The conference was a friendly one, and a basis of adjustment was soon reached. The company agrees to pay the freight conductors 3 cents a mile, and on their part the conductors abandon their claim for overtime by agreeing to accept the 3 cents a mile in full satisfaction. The freight traffic was resumed at once.

Troy & Boston.—A dispatch from Troy says that the Troy & Boston will soon pass into the control of the Fitchburg Co. The Troy & Boston directors a few days ago adopted a resolution directing that the proposition to consolidate with the Fitchburg be submitted to the stockholders. This resolution is now being carried into effect, and a majority of the answers thus far received are said to be favorable to consolidation.

Union Pacific.—At a recent meeting of the board in Boston President Adams stated that the government requirements for the first nine months of the present year were only $500,000, or nearly $300,000 less than had been estimated. A statement for the nine months was submitted, showing a surplus over all fixed charges and government requirements of $2,188,927.

At this meeting a draft of the proposed lease of the Oregon Railway & Navigation Co.'s line was submitted and approved by the board. This lease was referred to the executive committee for such changes in the minor details as might be recommended by the counsel. Under the terms of the contract the lease is taken by the Oregon Short Line Co. and guaranteed by the Union Pacific Co. The lessee assumes all the liabilities and guarantees 6 per cent. dividends on the stock of the lessor company. Provision is made for the extension of the Oregon Co.'s line and the building of branches.

Wabash, St. Louis & Pacific.—The Receivers have filed in the United States Court their report of receipts and disbursements from Sept. 1, 1886, to Nov. 30, 1886. The exhibit shows the following totals:

Balance, cash on hand Aug. 31	$65,288
Total receipts, Sept. 1 to Nov. 30, inclusive	5,124,225
Total	$5,180.513
Total disbursements, Sept. 1 to Nov. 30	4,918,682
Balance, cash on hand Nov. 30	$271,431

This statement does not represent the earnings of the road, but the actual cash receipts and disbursements.

In Chicago, Dec. 16, Judge Gresham, in the United States Circuit Court, made an order appointing Judge Thomas M. Cooley, of Michigan, receiver of this company's line in his jurisdiction—that is, of the lines in Indiana and Illinois. By an ancillary order of the Circuit Court for Ohio the appointment was subsequently extended to the lines in that jurisdiction also, making Judge Cooley Receiver of all the lines east of the Mississippi. The new Receiver has filed his bonds, and will probably take charge of the property Jan. 1. Messrs. Humphreys & Tutt remain Receivers of the lines west of the Mississippi. The case is to be brought before United States Circuit Court in St. Louis in order to determine as soon as possible the many questions which arise in the division of the property.

The Purchasing Committee has made an offer to pay the holders of first-mortgage bonds on the Chicago Division and on the Decatur & East St. Louis Division all their back interest, on condition that some arrangement is made by which the possession of those lines can be given to the Purchasing Committee. Should this arrangement be made the committee will control the line from Chicago to St. Louis, which they can operate in connection with the line west of St. Louis. It is not, however, very clear that this arrangement can be made or that the Court will sanction it.

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Hanover Junc., Han. & Get'g.	44	Stewartstown	598
Hartford & Conn. Western	881	Terre Haute & Indianapolis	470
Housatonic	192	Terre Haute & Logansport	470
Houston & Texas Central	272	Texas & New Orleans	770
Huntingdon & Broad Top Mt.	120	Tol., Ann Arbor & N. Mich.	621
Illinois Central	174	Traverse City	652
Indiana, Bloom. & Western	754	Troy & Greenfield	228
Indianapolis & St. Louis	208	Union Pacific	239, 866
Indianapolis & Vincennes	652	Utica & Black River	272
International & G. No.	367	Valley (Virginia)	826
Iron	498	Vicksburg & Meridian	622
Jeff., Madison & Indianapolis	652	Vicksburg, Shreveport & P.	423
Kans. City, Ft. Scott & Gulf	486	Virginia Midland	139
Kans. City, Springfield & Mem.	486	Western Maryland	139, 861
Kansas City Union Depot Co.	396	Western North Carolina	192
Kentucky Central	770	Western Union Telegraph Co.	714
Knox & Lincoln	881	West Jersey	622
Lake Shore & Mich. So.	23, 323, 814	Wheeling & Lake Erie	698
Lawrence	651	Wilmington, Col. & Augusta	104
Lehigh Coal & Navigation Co.	140	Wilmington & Northern	652
Lehigh Valley	68, 224	Wilmington & Weldon	104
Leh. & Wilkes-Barre Coal Co.	139	Wisconsin Central	583
Little Miami	394	Worcester, Nashua & Roch.	196
Little Rock & Ft. Smith	595	Wrightsville & Tennille	251

Boston & Lowell.

This company owns a line from Boston to Lowell, Mass, 26½ miles, with 67½ miles of branches. It leases the Nashua & Lowell, 14½; Stony Brook, 13; Wilton, 15½; Peterboro, 10½; Manchester & Keene, 29½; Northern (New Hampshire), 83; Boston, Concord & Montreal, and branches, 187; Concord & Claremont, and branches, 90; St. Johnsbury & Lake Champlain, 132; in all 94 miles owned and 575 leased, a total of 669 miles worked. The report is for the year ending Sept. 30.

During the year the company also worked under contract the Central Massachusetts, 44 miles; this road is now leased.

The company has also a contract under which its trains run over the Concord road, from Nashua to Concord, 35 miles.

The balance sheet, condensed, is as follows:

Capital stock		$5,129.400
Funded debt		4,346,400
Accounts and balances		2,491,817
Profit and loss		486,194
Total		$12,453,811
Road and equipment	$7,839,382	
Other property	2,357,066	
Cash and cash assets	2,257,363	
		12,453,811

Capital stock was increased last year by $587,700, as noted below. Funded debt was increased by $300,000 new bonds.

The earnings for the year were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P.c.
Earnings	$4,628,386	$4,037,440	I. $590,946	14.8
Expenses	3,184,470	2,623,434	I. 561,036	21.8
Net earnings	$1,443,916	$1,414,006	I. $29,910	2.1
Gross earn. per mile	6,918	6.961	D. 43	0 6
Net " " "	2.158	2,438	D. 280	11.6
Per cent. of exps	68.8	65.0	I 3.8	...

Taxes are not included in the expenses in either year.

The result of the year was as follows:

Net earnings, as above		$1,443,916
Taxes	$170,175	
Rentals	718,569	
Interest	253,084	
Dividends, 6 per cent.	290,133	
		1.431.961
Balance, surplus		$11,955

The report says: "There has been charged in accounts the past year the full amount of money paid the Boston, Concord & Montreal Railroad, but said payments have been in excess of the rental due that road by a considerable sum. The lease of that road provides that its rental shall be 25 per cent. of the gross receipts of the Northern, Concord and Claremont, N. H., Railroad, and the Boston, Concord & Montreal Railroad, less $200,000 per year; and provides further that this road shall guarantee that said rental shall be sufficient to pay the interest on its indebtedness, the rental due the Pemigewasset Valley Railroad, and 6 per cent. on the preferred stock of the Boston, Concord & Montreal Railroad for the first year of the lease and 5 per cent. thereafter. Under the lease, therefore, the maximum rental, according to the statement given us at the time of its execution, was $292,476 for the first year and $284,476 for the second and thereafter.

From June 1, 1884, to Oct. 1, 1886, there has been paid on account	$700,000
Guarantee under lease would have been	671,777
Making amount paid more than was guaranteed	$28,223

"This amount will come back to this corporation in any settlement with the Boston, Concord & Montreal Railroad whenever had.

"At the time of the lease of the Boston, Concord & Montreal Railroad there were turned over to this corporation certain stocks, bonds and miscellaneous assets of a value unknown, but estimated to be sufficient to meet a considerable deficit, should one occur in the operation of that road under the term of its lease. These do not appear upon our books and have not entered into our statement of earnings.

"A summary of our financial position with the Boston, Concord & Montreal Railroad will be found below:

Amount overpaid on guaranteed rental	$28,223
Amount due from miscellaneous properies not appearing in our books or accounts	162,865
Amount of improvements authorized and made, charged to repairs, but which are due this corporation, about	50,000
Showing that since June 1, 1884, we have earned more than shown by our reports to either stockholders or Railroad Commissioners	$241,088

"The rental account shows a balance of $162,865 (as above) due this corporation, which we have a right to reimburse ourselves for out of the miscellaneous assets, whether we hold the lease of that road or not. These assets are, in our opinion, ample to cover this amount and any further sum found due under the lease for several years to come."

The traffic reported is as follows:

	1885-86.	1884-85.	Increase.	P. c.
Revenue train miles	3,942,422	3,293.511	648,911	19.7
Total locomotive miles	4,681,483	4,033,562	647 920	16.1
Passengers carried	6,700,030	5,944,344	755.686	12.7
Tons freight carried	2,581.655	2,227,558	354,097	15.9

Of the total number of passengers last year 2,385,116 were carried to Boston and 2,337,886 from Boston. Locomotives ran 1.19 miles to each revenue train mile.

During the year 1,044 tons of steel rails and 242,716 new ties were used in renewals. Eleven new locomotives were bought; 5 locomotives, 6 passenger and 50 freight cars rebuilt.

The report says: "The double track on our Middlesex Central Branch was completed to Lexington the past season and is now in operation.

"The total extraordinary expenditures for the improvement of the property, which might properly have been charged to either construction or equipment account, but which have been charged to operating expenses, were in the aggregate over $100,000, fully equal to 2 per cent. on the capital stock.

"The operation of the completed portion of the Central Massachusetts Railroad between North Cambridge and Jefferson's netted this corporation a loss for the year ending Oct. 1, 1886, of $44,837. It was found as a result of the year's operation that much business was lost to this corporation from the fact that its control was of a temporary nature, and a lease has been made for 99 years from Oct. 1, 1886, on terms which are thought to be favorable to our interests. Under the terms of the lease the loss already made is reimbursed to us, and, as the amount of the same is charged in the operating expenses of the past year, our report is really better than appears by just the amount of this loss. This road is now fully paying its operating expenses.

"Under authority granted by the last Legislature, chapter 278, acts of 1886, and as authorized by the stockholders at a special meeting, called June 24, 1886, for that purpose, the capital stock has been increased by the issue of 5,877 shares, the proceeds of which have been applied to the purchase of the stocks and bonds and in payment of the indebtedness of the roads named in said act.

"Our leased lines have done better the past year than we had expected, owing to the large reductions made in our tariffs in New Hampshire. We are more than satisfied with the outlook in connection with the future operation of those lines, and believe that a decision by the New Hampshire Court, which will sustain the validity of our leases, thus allowing us to make much needed expenditures on them, will enable us to develop a business which will make those leases a source of considerable profit."

New York Central & Hudson River.

The statement of this company for the year ending Sept. 30, with the earnings for the last quarter estimated, was published some time ago (Oct. 8, page 698). The corrected statement for the year is now issued and is given below.

It is to be noted that while the estimated earnings differed very slightly ($6,507 only) from the corrected statement, the estimated expenses were $362,624 greater than the actual amount, giving a correspondingly greater amount of net earnings, and making the profit for the year equal to 5.20 per cent. on the stock, instead of 4.79, as estimated.

The general balance sheet was as follows on Sept. 30, as compared with last year:

Assets:	1886.	1885.
Cost of road and equipment	$146,630,682	$146,074,836
Stock and bonds of other companies	3,469,321	3,472,331
Ownership in other lines, real estate, etc	6,607,590	6,395,551
Due by agents and others	3,120.072	3,861,106
Supplies on hand	1 470,869	1,220.222
Cash on hand	2 193,346	711,998
Harlem construction account	26,058	201,715
Equipment Harlem line	404,394	404,394
West Shore construction account	39,285	...
Total assets	$163,961,617	$162,342,153
Liabilities:		
Capital stock	89,428,300	89,428,300
Funded debt	56,424,333	56,424,333
Bonds and mortgages on real estate	107,000	107,000
Past due bonds	13,355	67 855
Interest accrued	1,370.936	879,926
Interest unpaid	7,487	9,179
Dividend payable Oct. 15	894,283	447 141
Dividends unpaid	89,525	67,122
Due for wages, supplies, etc	2,410,521	2,340,794
Due other roads, etc	1,753,418	2,062.171
Profit and loss	11,473,469	10,508,332
Total liabilities	$163,961,617	$162,342,153

There was no change in stock or funded debt during the year. The increase in cash on hand is notable.

The earnings for the year were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Earnings	$30,506,361	$24,429,441	I. $6,076,920	24.9
Expenses	18,610,377	16 319,372	I. 2,291,005	14 0
Net earnings	$11,895,984	$8,110,069	I. $3,785,915	46.7
Gross earn. p. mile	21,651	24.602	D. 2,951	12.0
Net " "	8,443	8,167	I. 276	3.4
Per cent. of exps	61.0	66.8	D. 5.8	....

The earnings last year include those of the West Shore road from Jan. 1, 1886, or three-quarters of the year.

The result of the year was as follows:

Net earnings, as above	1885-86. $11,895,984	1884-85. $8.110.069	Increase. $3,785,915	P. c. 46.7
First charges	7,245,885	5,312,726	1,312,159	22.1
Profit	$4.650.099	$2,176.343	$2,473,756	113.7
Dividends	2,577,132	3,129.991	447,141	14.3
Balance	Sur. $1,072,967	Def. $953,648	$2,026,615	....

The profit last year was equivalent to 5.20 per cent on the stock, against 2.43 per cent. in 1884-85. The dividends paid last year were 4 per cent., against 3½ per cent. in the preceding year. The surplus remaining was equal to an additional 1.2 per cent. last year.